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ACUTE PERFORATING GASTRIC AND DUODENAL ULCER.*

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The clinical features of gastric and duodenal ulcer are so closely allied and the results of their sudden or gradual rupture into the peritoneal cavity, together with the treatment of that unfortunate accident, are so nearly identical, that their simultaneous discussion is quite justifiable. This striking similarity is easily accounted for by the fact that the pylorus and the first part of the duodenum are the most frequent sites of the ulcer and that, at times, the perforation is so close to the junction of these two structures that the ulcer, as observed in the course of the operation, would be referred with equal frequency to either one or the other viscus according to the judgment of each individual operator. Hence statistics dealing with the relative frequency of duodenal and gastric ulcer are necessarily inaccurate.

Perforating ulcer in other parts of the stomach than the pylorus is not infrequent, although an exception, while perforation in the more distant parts of the duodenum are rare. Even in these less common situations, the clinical features of perforation do not merit individual discussion, although it is best to briefly call attention to the following facts:

Gastric ulcer is more frequent in women than in men. It is much more frequently associated with anemia and is most common between the 20th and 30th year.

Duodenal ulcer is more common in men, and it occurs more frequently between the 30th and 40th year in alcoholic subjects, especially in those who indulge in malt liquors. For elaborate details in this connection, the writer refers to the exhaustive analyses of F. Brunner,[7] F. and G. Gross[26] and to Goldstücker. [28]

That no age is exempt from perforation is well demonstrated by the case reported by Cheyne,[76] of a perforating ulcer in a boy of 13; by Martens[43] of a similar condition in a girl of 6; by Patterson[59] of a perforation two inches below the center of the lesser curvature in a boy of 12; by Harnett[29] of a pyloric perforation in a male of 65; by Caird [13] of a perforation near the middle of the lesser curvature in a boy of 12; by the same surgeon[13] of a perforation on the posterior surface of the pylorus in a male of 71; by Bisset of a perforation of the stomach wall in an infant 45 hours old; and by Keen and Musser[78] of a pyloric perforation in a male of 70 which, owing to the patient's advanced age was thought to have been carcinomatous until the contrary was proven by microscopic examination of the excised ulcer.

An accurate knowledge of the character and location of the perforation, together with the lesions of the subsequent spreading peritonitis is of the utmost importance in arriving at a prompt diagnosis when the abdominal cavity is opened and serves as a most valuable aid in the selection of the proper plan of treatment.

That no part of the stomach is immune; that owing to the absence of contiguous solid viscera and other means of protection, acute perforation of the anterior wall is more likely to lead into the general peritoneal cavity; that such perforation is more frequent near the pylorus and lesser curvature; that approximately in one-fifth of the cases, acute perforation takes place through the posterior wall of the stomach into the lesser cavity, are all well known facts and established by abundant clinical and pathological evidence.

The size of the perforation varies from an orifice so small as to defy detection to one sufficiently large to admit the tip of the finger, while the shape may be circular, oval or of irregular outline. The edge may be soft or indurated, sharp or ragged on the same plane, or raised above the surrounding surface. The perforation not infrequently is at or near the center of an inflammatory zone of induration so friable as to predispose the cutting out of any suture by which the closure of the perforation is attempted.

Ulcers of the duodenum present similar charac-

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teristics. The great majority are situated on the anterior surface of the first part of the duodenum. Exceptionally, the posterior surface is involved. In the second portion perforations are much less frequent. In this situation, those on the anterior surface lead directly into the general peritoneal cavity while perforations on the posterior surface are, for obvious reasons, extraperitoneal. Perforations in the third and remaining portions of the duodenum are exceedingly rare.

That ulcers in the stomach and duodenum are occasionally multiple is well known. F. Brunner[7] estimates that in from one-third to one-quarter of all cases of perforation, other ulcers besides the one in which perforation has taken place, may be found. That perforation *per se*, on the other hand are occasionally multiple, cannot be too strongly emphasized. In this connection it is of interest to briefly note the following instances:

Bell[79] and Currie[80] report, respectively, such multiple perforations near the cardia. Parker reports an instance of two perforations close to one another near the cardia. Faure [81], Dirriot and Appert mention an instance of two perforations symmetrically placed on the opposed walls of the stomach midway between the pylorus and the cardia, near the lesser curvature. Neither perforation was discovered at the time of operation. Rabagliati[82] reports an instance of multiple perforation of which that on the posterior wall was cleared by suture, while that on the anterior wall was overlooked. Steele[83] reports an instance of multiple perforation where the one on the posterior wall, a little to the right of that on the anterior wall, but nearly opposite, was overlooked; both perforations being near the cardia. Stelzner[84] reports an instance of multiple perforation, similarly symmetrical, where the perforation on the posterior wall was overlooked. Demons[85] reports an instance of multiple perforation, also symmetrical, where the perforation on the posterior wall, free from induration was overlooked; both perforations were near the cardia. Page[86] reports one large perforation 2 c.m. in diameter on the anterior wall and close to it a smaller perforation not larger than a pin head. Bourlot[87] reports two perforations symmetrically placed on the opposed walls. Vianny[88] reports three perforations near the pylorus adjacent to one another. Körte[37] reports an instance of a perforation on the anterior wall near the lesser curvature, midway between the pylorus and the cardia and on autopsy, fifteen days later, a second perforation was found near the one originally sutured. The same author reports another instance of a perforation the size of a millet seed near the lesser curvature, midway between the pylorus and cardia, and one c.m. to the left of this a second perforation the size of a finger tip. This case recovered, Brentano[11] has collected sixty-six cases of perforating ulcer, in five of which the perforations were multiple, being placed on the anterior and posterior walls respectively. Koerber[34] reports an instance of multiple perforation near the middle of the posterior wall, undiscovered at the time of operation. Analysis of the foregoing cases shows that they may be divided into two groups; those in which several small contiguous perforations occur simultaneously in the same ulcer, and those in which perforations occur simultaneously in more than one ulcer. In this latter group the number of instances in which the ulcers are symmetrically placed on the opposed walls of the stomach and generally near the cardia is astonishing in comparison with the few scattered cases in which both perforations are situated on either the anterior or posterior wall only.

When perforation has taken place, the escape of the gastric contents unimpeded into the peritoneal cavity, results usually in a spreading general peritonitis, which is more symmetrically developed in perforation of the anterior wall of the stomach than in perforation in the anterior wall of the duodenum. In the latter situation, the right half of the abdomen is at first more extensively involved, the gastric contents passing easily downward along the right lumbar gutter into the pelvis. The gastric contents consist of partially digested food of a peculiarly "sour" quality with frequently an admixture of gas which, for at least twenty-four hours, is generally free from odor and of a quantity so large that its escape through an abdominal incision is accompanied by a distinct "hissing" sound.

The rapidity with which the peritonitis develops varies according to the size of the perforation, the amount and condition of the gastric contents and the ease with which the escaping contents can pass into the more remote parts of the abdomen. Perforation of a very small size occuring in the anterior wall of an empty stomach, with the patient recumbent, would incite a much less virulent and extensive peritonitis than would a perforation sufficiently large to permit of the passage of a large amount of stagnant gastric contents immediately into the pelvis, with the patient in the erect position.

Bacteriological investigations similar to those reported by C. Brünner,[6] show, at times, a considerable variety of streptococci and other pyogenic organisms in the peritoneal exudate the spread of which and propagation into the more remote parts

of the abdomen is largely favored by the peristaltic movement of the abdominal viscera. The escaping contents are also markedly irritating, although in the absence of stagnation, the aseptic gastric juice diminishes somewhat the virulence of the infection.

For this reason gastric contents are notably less infectious than duodenal contents, and an early operation in gastric perforation yields better results than is the case with duodenal perforation. In perforation through the wall of either viscus, however, the spread of the peritonitis is so rapid that its extension can be checked and the life of the patient saved in most instances, only by operation within the first twenty-four or thirty-six hours.

In perforation in the posterior wall of the stomach the lesser peritoneal cavity is at first invaded and if obliteration of the foramen of Winslow has taken place, the resulting peritonitis may be limited to that part of the abdomen. In this situation, however, the infection easily extends into the subphrenic space.

The lesions which develop later are the direct result of the extension of the peritonitis and include subphrenic abscess, fistulous intravisceral communications, pleurisy, of the serous and purulent varieties, bronchitis, pneumonia, abscess of the lung and pulmonary embolism, ileus, phlebitis, parotitis and other less frequent conditions which require no special consideration.

The fact that acute gastric and especially acute duodenal perforation is frequently mistaken for acute appendicitis warrants a brief statement of the chief gross pathological differences of these two conditions when, under the impression that an acute inflammation of the appendix exists, the right lower quadrant of the abdomen is opened. In both, fluid usually escapes when the peritoneum is divided. In gastric or duodenal perforation, this fluid is yellow, usually free from odor and is distributed uniformly and without change of color, odor or consistency around the cecum and between the intestinal loops that lie in the pelvis. It is usually more abundant as the upper part of the ascending colon is exposed. The change in the appendix is limited to its peritoneal coat which, like the serous investment of the adjacent intestine, may be reddened and injected. In a severe acute appendicitis, on the other hand, the fluid near the parietal peritoneum is usually serous. It is relatively small in quantity and free from odor. As the appendix is approached, however, the fluid rapidly becomes turbid and finally the appendix discolored and friable, is usually found surrounded by thick offensive pus which may be in whole or in part shut off by adhesions from the general peritoneal cavity. In the absence of such characteristic changes both in and around the appendix, the source of an incipient general peritonitis of dubious origin, most probably lies in a perforation of the stomach or duodenum, and the exposure and thorough search of these two structures should follow immediately.

A most careful consideration of the clinical features of perforating gastric and duodenal ulcers is justified by the fact that it is only by prompt diagnosis and early operative treatment that the virulent and rapidly spreading peritonitis can be effectively checked.

Practically unrecognized until 1880 when Miculicz, as assistant to Billroth, did the first operation, which was repeated by himself and others in scattered instances without success until 1892, when Heussner's patient recovered. In 1893, H. Gilford in England, Michaux in France, and Roux in Lausanne, and in 1894 Atherton in this country, operated successfully. The early failures were due, mostly to the fact that operation was not done sufficiently prompt, and although earlier recognition and improved operative technic are responsible for the much better results recently achieved, yet, that there is still room for further improvement is shown by the fact that in all lists of published cases many patients, if not actually moribund, were brought to the surgeon's attention too late for operation to prove of value. That such conditions still exist in different parts of this country is clearly shown by the two following communications in response to an inquiry by the writer.

"I regret very much indeed that I cannot, in a succinct way, answer your questions in regard to perforating ulcer of the stomach and duodenum. My experience in this field of surgery has unfortunately been very limited. Our medical men, I am afraid, in this vicinity, have not been sufficiently educated to make the experience of any surgeon in this community very valuable."

Another experienced surgeon writes as follows: "I have records of but seven cases of perforating ulcer of the stomach or duodenum. The condition is rarely recognized by the average practitioner here until too late. All of the seven cases died, four without operation, three with operation. These three had general peritonitis when operated on. In two, the perforation was found, closed and drained. In the third, I didn't have time to look for it, as the patient was in collapse and scarcely survived to get him off the table. That isn't much of an experience."

It is chiefly in the hope of facilitating early diagnosis by those whose experience is necessarily lim-

ited in this class of cases that the writer ventures to describe, in what may appear to be needless detail, the clinical features of gastric and duodenal perforation. Of considerable assistance, frequently, is the history of previous gastric ulcer with one or more of its classical symptoms. Yet it is an experience common to all that such a previous history may be entirely absent, the perforation occurring without the slightest premonition. Thus, in sixty-seven cases collected by Haim,[31] in which this point was mentioned, all previous history was lacking in seven. Goldstücker[28] has collected ninety-six cases in which twelve had no previous symptoms of ulcer. Reference is made by the same writer to Englisch's series of thirty-seven, in which no previous history could be obtained in five; of Brentano who states that fifteen of sixty-four, had no previous history; of Moynihan, who writes that of forty cases, five had no previous history, and of Garré, who estimates that at least 10% of perforations are without previous history.

Such a history, even when present, is usually much less distinct than that which ordinarily occurs in a typical case of gastric ulcer. In fact, in many instances ill-defined pain with obscure dyspeptic symptoms are often misleading in that they suggest a previous chronic cholecystitis, appendicitis or salpingitis, and in fact many such cases are operated on shortly after the acute invasion for supposed appendicitis in which the appendix is found to be normal and further investigation reveals a perforating ulcer. Furthermore, the past history may not only be obscure but it may be of comparatively short duration, a period of several weeks only preceding perforation.

Such irregularities in the history as well as the occasional lack of any previous history, account in part for the erroneous diagnosis of appendicitis that is not infrequently made even by the experienced observer, an error which is most important to avoid as in acute perforating ulcer a delay of more than twelve hours in operation places the life of the patient in much greater jeopardy than a delay of equal duration in many cases of acute appendicitis.

The acute invasion of perforation is most always marked by the most excruciating pain, somewhat differently described as knife-like, tearing apart, lancinating, agonizing, etc. It often doubles the patient up and prohibits any effort. The onset of the perforation comes without warning and seems to bear no special relation to eating or drinking; it sometimes follows a blow or other form of sudden or violent exertion, such as lifting or straining; it may occur in the middle of the night and rouse the patient from a sound sleep. The pain is referred to the epigastrium or to the left or right hypochondrium. The latter situation is most common in perforation of the duodenum, the left hypochondrium in perforation at or near the cardia, while the pain in pyloric perforation is usually referred to the epigastric region. Nearly always the pain is referred to some point above the level of the umbilicus. Usually the patient can locate the point or area of maximum pain, although at times it may be so diffuse that it is referred in general and with equal severity to both sides of the abdomen both above and below the level of the navel. The point of maximum pain is subject to many exceptions. Thus Koerber[34] makes the statement that pain over the spleen and left hypochondrium indicates a perforation through the posterior wall of the stomach into the lesser peritoneal cavity. It is not infrequently and especially in duodenal perforation, referred to some point below and to the right of the navel, thus simulating appendicitis.

This leads to the not infrequent placing of the incision over the appendix in cases of duodenal ulcer, the error being recognized only after the peritoneal cavity has been opened and the appendix found in a normal condition. Of considerable interest was the location of the pain and tenderness in the third case reported by Harnett,[29] in the left hypochondrium left lumbar and right iliac regions, in a perforation through the anterior wall of the stomach. Exceptionally, pain occurs over the sixth, seventh and eighth costal cartilages in perforation near the cardia. Occasionally, the pain is referred to the back, especially to the region of the shoulders and of the vertebral column and sacrum. The pain may even extend down to either lower extremity and so obscure the actual site of the lesion.

The pain, irrespective of its position, is frequently intensified by attempted diaphragmatic breathing or by attempted change in the position of the patient from one side to the other, or later on by flexion of one or both thighs; it may also be increased by leaning forward or by the attempted raising of the shoulders from the bed or by an accidental sneeze or cough. The patient is most comfortable in the dorsal position.

Vomiting.—This occurs in at least two-thirds of the cases with, or shortly after the invasion, and is a manifestation of peritoneal irritation. It is not infrequently absent until the onset of the peritonitis, of which it is one of the most constant symptoms. At the onset, it is more common in duodenal than in gastric perforation, probably because of the more highly irritating character of the intestinal contents.

It may be repeated and occasionally it is persistent. The vomitus consists of the stomach contents and later on bile. Hematemesis is rare.

The patient is ordinarily prostrated by the pain. Syncope is the exception. It is most apt to be present in perforations of large size that are necessarily associated with rapid extravasation of the gastric contents into the peritoneal cavity.

There may be constipation, but there is rarely any difficulty in the passage of a moderate amount of flatus.

Physical Examination.—On inspection, the abdomen is held motionless, the respiration being increased in frequency, shallow and largely thoracic. The epigastric region is at first retracted, the upper anterior abdominal wall being thus placed in close contact with the abdominal contents and thereby delaying the passage of the gastric contents into the more remote parts of the peritoneal cavity. Within the next few hours, certainly within the first twenty-four hours, a variable degree of asymmetrical abdominal distension appears. This is especially marked in the epigastric region and is generally the result of the accumulation of the escaped gas in that part of the abdominal cavity.

On palpation, abdominal rigidity is a most constant and important symptom; it is readily detected by making slight pressure against corresponding segments of the two sides of the abdominal wall. To insure accuracy, this symptom should always be elicited during expiration, the patient being supine with the knees flexed on the pelvis. The search for muscular rigidity is not complete without thoroughly testing the resistance of the costal arch. This is also carried out during expiration, corresponding portions of the lateral costal margins being forcibly compressed toward the vertebral column. The determination of the maximum point of muscular rigidity is of as great importance as the detection of muscular rigidity proper, for it serves a most useful guide to the site of the perforation.

In acute perforating duodenal ulcer the resistance is usually most marked in the upper right quadrant and the adjacent part of the right costal arch. In acute perforating pyloric ulcer, the upper portions of both recti muscles, together with the adjacent segments of both the right and left costal arches are symmetrically rigid while in acute perforation near the cardia, the maximum rigidity is found in the upper left rectus and the adjacent left costal arch. Exceptions to this general rule become more frequent with the increase in the length of time that elapses after the perforation has taken place for the reason that the resulting peritonitis may produce a greater degree of rigidity in some distant part of the abdominal wall than in that which overlies the site of perforation.

This is especially the case in duodenal perforation where, after twenty-four hours, the rigidity may be most marked in the lower right quadrant, thereby simulating acute appendicitis, and conversely, the writer has observed instances of general peritonitis from an original gangrenous appendix, in which the rigidity was most pronounced in the upper left quadrant. It is well to emphasize, therefore, that the physical signs here described are those which may be elicited prior to the development of the secondary peritonitis.

Local Tenderness.—This is both a subjective and objective symptom. The patient commonly refers the sensation of tenderness to the site of the pain and it is elicited by the surgeon in his search for muscular rigidity. The point of maximum tenderness is a useful, although not quite as reliable a guide, as the point of maximum rigidity to the site of perforation. The sudden withdrawal of pressure is accompanied at times by an exaggeration of the pain, and pressure on a distant point of the abdomen, which is in itself comparatively painless, may on its withdrawal, provoke increased pain in the neighborhood of the perforation.

Palpation through the rectum is of considerable value when the peritonitis has extended into the pelvis in that it elicits tenderness usually to a greater extent on the one side than on the other, the tenderness being referred by the patient to a point on the anterior abdominal wall.

Percussion is of value in determining the presence of fluid in either flank. The resulting dulness is more common in duodenal ulcer in the right flank, while in perforation near the cardia, it is more likely to appear in the left flank. The early appearance of this symptom depends upon the amount of fluid in the stomach contents at the time of perforation, although subsequently similar physical signs may be elicited over a secondary peritoneal exudate. The quantity of fluid may at first be so small that dulness can be elicited only with the aid of auscultation. At no time should the test of shifting dulness be made, for not only is the quantity of fluid so small that the percussion note would fail to be affected by a change in the patient's position, but the necessary movement in the patient's body greatly intensifies the pain and favors the rapid spread of the infectious fluid to the more remote parts of the peritoneal cavity.

The disappearance of liver dulness through the interposition of free gas in the peritoneal cavity is

a symptom of variable value according to each individual observer. Its absence unquestionably affords no proof whatever against thes existence of a perforation, while it may be present under normal conditions as a result of either an increase in the quantity of gas in the transverse colon or as a result of the interposition of that viscus between the liver and the anterior abdominal wall. It is probably of the greatest value when its development can be observed from hour to hour as the quantity of escaped gas increases. As a general rule this symptom should never in any way be allowed to determine the question of operation.

On auscultation, friction sounds due to the rubbing of opposed surfaces covered with fibrinous exudate or splashing sounds due to the admixture of gas and serous exudate are exceptionally elicited.

The temperature is moderately increased, but this is in no way a symptom of any value. The character and frequency of the pulse is of far greater value than the degree of temperature, yet, owing to its wide variability, it is frequently misleading, being in some instances slow and without change of tension, while in others, especially in those of large perforation, with rapid extravasation of gastric contents, the pulse may be both rapid and weak. In neither event should operation be deferred. Even when the patient is in a condition of shock, a delay in operating until the shock has either decreased or disappeared is positively contraindicated.

Leucocytosis is a very valuable symptom. Examination of the blood shows ordinarily an increase in the general leucocyte count, while the polymorphonuclear cells are increased. Federman[21] calls attention to the fact that, on the first day in his cases the general leucocyte count varied between 12,000 and 28,000, and that a relatively low leucocyte count with severe local and constitutional symptoms made the prognosis serious. On the second day the prognosis was more favorable in those cases in which the leucocytosis remained relatively high, as in one of his successful cases, in which the leucocytosis was 20,000, while the prognosis was much more serious in those cases in which the leucocytosis decreased below 15,000, the percentage of mortality varying directly with the rapidity of such decreases. In illustration of this principle, Federman cites a case admitted to the hospital on the second day with a leucocytosis of 17,000. Operation was contraindicated on account of the generally bad condition, yet the patient lived for five days, the leucocytosis gradually decreasing until, on the fourth day, it had reached 12,000, where it remained until the death of the patient. Federman mentions no case in which a differential count was made. The writer suggests the value of a differential count as a means of preventing operation in those cases of hysteria and other non-infectious troubles, which, by their symptoms, simulate acute perforating ulcer. It is interesting in this connection to note the leucocyte count in ordinary ulcer without perforation. Through the kindness of Dr. George Draper, of the House Staff of Presbyterian Hospital, thirty-five cases of simple gastric ulcer were collected from the medical records in which there was an average leucocyte count of about 10,000. One case showed an extreme count of 22,500 with a polymorphyonuclear of 84%, while the lowest count was 5,000 in a case that had undergone treatment in the hospital for two weeks.

Treatment of Perforation.—Laparotomy is the only rational treatment of acute gastric or acute duodenal perforation. The fact that recovery is possible without operation does not justify conservative measures. Such instances are rare, and the diagnosis, in the lack of operative confirmation, is at least uncertain. Not only is operation imperative but it should be done at the earliest possible moment. The fact that the majority of patients operated on before the twelfth hour recover, while most of those operated on after the twenty-fourth hour of the perforation die, cannot be too strongly emphasized. The severe pain should be alleviated by morphin only after the diagnosis has been made and the necessary treatment definitely determined. Persistent severe pain convinces the patient of the need of operation more quickly than any argument which the surgeon can advance, while its alleviation by morphin is as frequently regarded by the patient as an indication of improvement and the operation is then apt to be deferred too long to be of material value. It is the writer's earnest belief, that in all cases of sudden acute abdominal pain morphin is positively contraindicated and its use should be withheld until the need of surgical attention has been definitely settled.

The operation is best done under general anesthesia, chlorofrom being preferred. All necessary preparation should be completed before the administration of the anesthetic is begun in order to shorten as far as possible the length of the operation. Preliminary lavage is unnecessary and even the emptying of the stomach by the syphon action of a tube is undesirable as the associated gagging is likely to bring about the extravasation of additional stomach contents into the peritoneal cavity.

The incision is made over the site of the supposed

perforation; in perforation of the anterior wall of the stomach and pylorus, in the mid-line above the umbilicus, while in duodenal perforation the incision should be either parallel to the outer edge of the right rectus muscle or through the substance of that muscle. In Case III, here reported, excellent exposure of a duodenal perforation was obtained through a mid-incision from the upper extremity of which, a transverse incision to the right was made through the rectus muscle thus conserving its innervation. The advantage of the pararectal incision apart from the excellent exposure which it affords, is the ease with which the abdominal incision can be closed. The incision should be sufficiently long to provide for adequate exposure of the perforation. It should be remembered that, other conditions being equal, the shorter the incision the shorter the operation and the greater the chances of recovery. Ordinarily the necessary steps can be carried out through an incision of not more than four inches in length.

On opening the peritoneal cavity, the escape of gas is frequently noticed together with a variable quantity of yellow tinged fluid with possibly some gastric contents. This field is rapidly sponged away with the least possible disturbance of the abdominal contents which, if held back by suitable pads, permit an excellent exposure of the stomach and the part of the duodenum above the transverse colon. Search is then made for the perforation in the direction from which the largest amount of fluid exudes; the presence of a fibrinous exudate around and about the perforation serving as an additional guide. Prior to the closure of the perforation the stomach and duodenum, if distended, can easily be emptied of their contents by appropriate syphonage or by expression and by that means all unnecessary tension upon subsequent sutures is avoided. The remaining steps comprise: (1) the closure of the perforation; (2) the cleansing of the peritoneal cavity; (3) examination of the posterior wall of the stomach and duodenum for multiple perforations; (4) drainage and closure of the abdominal incision.

(1.) Closure, by some form of suture such as Lembert, mattress, or purse-string applied in such a way as to minimize subsequent constriction of the lumen of the gut, is accomplished by having the completed suture line at right angles to the long axis of the pylorus or duodenum. This is without doubt the most frequent form of treatment and ordinarily yields satisfactory results. The necessary suture is not always easily applied, however, for either the depth of the perforation, especially when it is at, or near the cardia, or the friability of the adjacent visceral wall may render the insertion of such a suture either impossible or untenable. It is because of this occasional weakness of the sutured perforation that, in order to prevent a recurrence of the perforation or a subsequent fistulous formation, the site of suture is still further strengthened by the superposition of an omental flap. In fact, such a flap has occasionally formed the sole means of closure as in the cases reported by Braun[89] and Gibbon, where the tissue was friable or the perforation relatively inaccessible. A similar omental flap has been inserted directly through the perforation like a cork or plug and then held in place by sutures between it and the adjacent surface of the stomach. This method has met with indifferent success, although some recoveries are recorded, and is inferior to other means of closure. The following instances of cases treated in this way are reported as follows: Two cases of recovery by Bennett[90] and by Bonheim[4] respectively, the latter complicated with hemorrhagic pulmonary infarct and by phlebitis of the lower extremity during convalescence. Two fatal cases, one by Koerber,[34] where this method was practiced in a friable perforation in the middle of the anterior wall just below the lesser curvature, in which death occurred thirty-one hours after the operation and an autopsy showed the presence of odorless gas in the peritoneal cavity and the cutting out of the sutures which held the omental plug in place allowing the protrusion through the orifice of a strip of gastric mucous membrane. The other reported by VanEiselsberg[66] where death occurred twenty hours after the operation, the omental plug, on autopsy, proving gangrenous.

A still more satisfactory means of strengthening the sutured perforation is to cover it with an adjacent viscus. For this purpose the stomach can be infolded upon itself, a method, which if practised at the pylorus, must be conjoined with a posterior gastro-enterostomy to avert almost certain constriction. A more simple procedure, where a simultaneous gastro-enterostomy is unnecessary, is to cover the sutured perforation with the gall-bladder, an operation suggested and successfully practised in a case of large callus, friable pyloric ulcer by Bessel-Hagen.[91] A considerable number of inaccessible perforations or of perforations in the midst of dense adhesions have been successfully treated by simple tampon. Of these F. Brunner has collected a series of fifteen with only three deaths. In a majority of these cases a gastric fistula formed, but closed spontaneously and in a comparatively short time. In addition, Koerber reports a case of recovery treated in this way, where the perforation was not found

at the time of operation and Wood[92] reports a recovery in a patient where at the time of operation, fifty-two hours after the perforation had taken place, a condition of general peritonitis had already developed. The cases reported by Brunner are those numbered as follows in his table: 185-188 *Lennander.* 543 *Landerer and Glucksmann.* 502 and 503, *VanBeck.* 302-304, *Schlaffer.* 310, *Sherman.* 73, *Capaccini.* 3, *D. P. Allen.* 213, *Mauclaire and Dentu.* 562, *Pegram.* 277, *Prichard.* 355, *Villard.* 262, *Parker.*

A certain number of perforations have been treated by gastrostomy. These have usually resulted in the death of the patient. One successful case is reported by Villard,[68] in which gastrostomy was done for a perforation the size of a ten-cent piece near the lesser curvature, thirty-four hours after the perforation had taken place. Another successful case is reported by Paul,[93], in which, after closure of a perforation by suture and an omental flap, a second opening was made in the stomach through which a gastrostomy was established.

Lorenz[94] reports two cases, where, in the course of an operation for chronic ulcer perforation accidentally occurred. Both were treated successfully by gastrostomy with posterior gastro-enterostomy. F. Brunner has collected 13 additional cases (268, 15, 289, 246, 215, 573, 294, 120, 131, 129, 219, 253, 254), all of which resulted fatally, although many were in such a desperate condition at the time of operation that a favorable result could scarcely have been expected.

The treatment of the perforation by excision of the ulcer and subsequent suture is of value where the ulcer is easily accessible, as in the anterior stomach wall, and when this method can be practised without undue delay and without resultant constriction of the lumen of the gut. The part so removed is limited to the immediate friable and necrotic edges of the ulcer and does not include the entire area of induration, which, were it removed, might easily cause a gap which could not be closed effectively. That such excision affords a permanent cure is believed by none, for it can have no such effect on possible coexisting ulcers that have not undergone perforation, nor can it in any way, by removal of the cause, prevent the formation of subsequent ulcers. That it usually secures firm closure and that at all events it removes a possible source of subsequent cancer are its chief advantages. Among its enthusiastic advocates are Brentano, and Noetzel,[49] who reports fourteen cases treated in this way with six deaths.

The treatment of perforation by pylorectomy or by some form of pyloroplasty has been successfully accomplished. Pylorectomy has been done several times for a supposed malignant growth which subsequent examination proved to be benign. Keetly[95] reports a case of this character, and Bevan, in a personal communication, speaks of another. Pyloroplasty has been done by Tobin [96] for a perforation of nineteen hours' standing situated three c.m. anterior to the pylorus, which was the site of previous cicatricial stenosis. The perforation and contiguous pylorus was divided in its long axis and sutured in a line at right angles to that plane. Death occurred five days later from gastric hemorrhage, autopsy showing the line of suture intact. Three other ulcers were also found in the stomach.

Miles[47] reports a case of pyloric perforation of twenty-one hours' standing in which closure by suture would have unduly constricted the pylorus, and a gastro-enterostomy was contraindicated on account of the bad condition of the patient. A rapid pyloroplasty was therefore performed by the longitudinal division of the ulcer and perforation with transverse suture. The patient recovered. A similar procedure was attempted by Miles in a perforating duodenal ulcer for the same reasons, in a male of nineteen where the perforation was of fifty-six hours' standing. This patient died.

Some form of pyloroplasty must be done in perforation at the constriction of an hour-glass stomach. Two such cases are reported, one by Maunsell[97] in a perforation of sixteen hours' standing, in which recovery followed a pyloroplasty for a perforation in the narrowed part of an hour-glass stomach, the other by Hahn,[98] where an excision of the perforation and the narrowed portion with subsequent suture was practised with a satisfactory result.

After the necessary care of the perforation, that part of the abdominal cavity which has been soiled by gastric contents or which shows the usual indications of an infectious peritonitis, should always be carefully cleansed. Opinions differ according to the extent and the way in which this should be accomplished. While some advocate the cleansing of the entire peritoneal cavity in every case with or without evisceration (the writer is strongly opposed to evisceration), others limit the cleansing to the immediate neighborhood of the perforation. The proper course seems to vary directly according to the degree of diffusion of the gastric contents and the extent of the peritonitis. If the gastric contents are widely scattered and the peritonitis general, the cleansing of the entire peritoneal cavity is clearly indicated; on the other hand, in case of

operation a few hours after the acute onset of pain, the cleansing may be limited to the immediate vicinity of the perforation. As to the way in which this shall be accomplished, a more satisfactory cleansing, in the writer's opinion, is obtained by irrigation rather thau by dry sponging. If only local cleansing is necessary a small amount of fluid is gently poured into the desired segment of the peritoneal cavity, which is properly protected by pads, and the noxious material is quickly washed away. For purpose of general cleansing, the writer has found a suprapubic opening, which is generally advocated by English surgeons, of the greatest value; it permits thorough cleansing of the pelvis and serves as a ready means of exit or entrance for the irrigating fluid. An original incision extending both above and below the umbilicus, as advocated by some surgeons, would make such a counteropening unnecessary. Thearetically, the cleansing should be conducted in such a way that the soiled contents with the resultant peritoneal exudate should be made to retrace the path which it has followed in spreading to the more remote parts of the peritoneal cavity. On this theory is based the suggestion of Raughton[61] to irrigate through the suprapubic opening upward through the incision over the perforation, but as long as the irrigation is thorough, such special technic seems unnecessary. It is essential, however, to thoroughly clean the subphrenic spaces, for it is in the upper part of the peritoneal cavity that the infection is most virulent, a fact that accounts both for the much more frequent occurrence of post-operative abscess in these spaces as well as for the more rapid closing of the suprapubic opening. That a similar post-operative complication, however, may occur in the pelvis is shown by the case reported by Lauenstein,[39] but the diminished virulence of the infection in the lower peritoneum is clearly manifested by the less purulent character of the suprapubic discharge as well as by the more rapid closing of that orifice. The development of a subphrenic abscess is also materially prevented by placing the patient in the "Fowler" position, for with the upper part of the peritoneal cavity forming the summit and dome of that space, its fluid contents must necessarily gravitate away from the diaphragm.

A rapid search should now be made for a possible second perforation on the posterior wall of the stomach, which is first exposed by an opening through the gastro-hepatic, or the gastro-colic, omentum or by an opening through the transverse mesocolon. The best exposure of posterior perforations near the lesser curvature is obtained through an opening in the lesser omentum, while an opening through the transverse mesocolon gives the best access to posterior perforations near the greater curvature. An opening in the gastro-colic omentum, the least vascular of all, does not always provide sufficient room for the closure of a possible posterior perforation, although it is a very satisfactory route for determining the presence and character of an exudate in the lesser peritoneal cavity. The absence of gastric contents and of inflammatory exudate in the lesser cavity makes a perforation in the posterior wall of the stomach unlikely. Should such evidence of perforation be found, however, the writer wishes again to emphasize the frequent symmetry of multiple perforations as a distinct aid to their rapid discovery. The posterior wall should be first subjected to the greatest scrutiny at a point directly opposite the perforation in the anterior wall. The cardia and its immediate neighborhood should then be carefully examined and any additional perforation that may be found in this way properly closed or tamponed.

The question of drainage has also provoked considerable discussion. In cases of early operation for perforation, before the advent of peritonitis, the abdominal incision can usually be closed in safety without drainage. After peritonitis has developed, however, and in those cases where the surgeon cannot be certain of the security of the closure of the perforation, drainage by means of cigarette drains inserted to a point near the closed perforation, and, if necessary, through the suprapubic opening into the pelvis, is preferable. In general, the amount of drainage should be minimized for its excess undoubtedly favors the formation of adhesions which predispose to subsequent ileus.

The value of saline infusion as a post-operative measure can scarcely be overestimated in those cases in which the closure of the perforation is associated with considerable shock or in which this condition has already developed before the operation is attempted. Bonheim (2) has called attention to the advantage of using large amounts of suitable fluid and has achieved remarkable results by the use in some cases of as many as 4000 c.c. in a single infusion. In one of his successful cases of perforation of fifteen hours' standing, in a man of thirty-nine, the patient, almost moribund, received 3000 c.c. of saline infusion prior to the operation, a similar amount on the evening after operation, and the infusions were repeated at intervals so that at the end of four days the patient had received altogether seventeen liters.

One of the most interesting questions in connection with the treatment of perforating ulcer of the

stomach or duodenum is the question of a simultaneous gastro-enterostomy or of jejunostomy, the latter being advocated especially by Von Eiselsberg. That certain conditions render simultaneous gastro-enterostomy imperative is granted by all. After appropriate treatment of the perforation this operation is doubtless indicated where the closure of the perforation has unduly narrowed the pylorus or duodenum. Furthermore, it is also urgently indicated where the perforation has occurred in a stomach where the pylorus or duodenum is already the site of stenosis from the cicatricial contraction of an ulcer of long duration. In all other cases gastroenterostomy must be a matter of individual choice, and its advisability can only be definitely settled by the comparison of a large number of cases and their end results in which the perforation has been treated by closure or excision only with an equally large number in which a gastroenterostomy has been added. In support of a gastroenterostomy, the following possible advantages may be cited.

(a) That by preventing undue tension on the closed perforation, the danger of an immediate recurrence of a perforation is avoided.

(b) That the danger of perforation of additional ulcers in the stomach or duodenum is thereby prevented.

(c) That it serves to prevent hemorrhage from other ulcers than the one in which perforation has taken place.

(d) That it hastens the healing of all coexisting ulcers in the pyloric zone of the stomach and in the adjacent duodenum.

(e) In addition, Paterson states that gastroenterostomy promotes recovery in those patients in which the perforation is in an inaccessible part of the stomach, as in the vicinity of the cardia, and which therefore cannot be treated by suture, and cites such a case in which recovery followed this method of treatment. (*Lancet*, 1906, *Vol.* 1, *p.* 575.)

On the other hand, the opponents of a gastroenterostomy as a routine measure, at the time of the closure of the perforation assert

(a) That it prolongs an operation of emergency and thereby unnecessarily jeopardizes the chances of recovery.

(b) That it may serve as a means of carrying infectious material to a part of the peritoneum hitherto uninvolved.

(c) That is does not necessarily prevent secondary perforation and that it subjects the patient to the risk of a perforation at the point of anastomosis.

(c) That it does not necessarily prevent hemorrhage from other ulcers.

(e) That it does not always hasten or insure the healing of coexisting ulcers.

(f) That the subsequent history of patients in whom the perforation was treated by closure only has been generally one of complete relief from all previous gastric symptoms, and that in those cases in which the gastric symptoms either persist or recur, a secondary gastroenterostomy for their relief can be done more safely than at the time of perforation.

The actual value of these different arguments in support or in opposition to the addition of a gastroenterostomy to the simple closure of a perforation can only be determined by the consideration of a large number of cases, which unfortunately a careful search of the literature does not supply. The writer has been able to collect only thirty-four published cases treated in this way, and through the kindness of the members of the American Surgical Association and of other personal friends in New York, seventeen additional unpublished cases in which this plan of treatment was carried out. Of the thirty-four published cases of which brief abstracts follow, and in most of which operation was done within thirty-six hours after the perforation had taken place, there were twenty-three recoveries and eleven deaths. Of the seventeen cases above referred to, seven died. Of eighty-two cases furnished by the same surgeons, in which the perforation had been treated by closure, only twenty-eight, or about one-third, died. In none of these published or unpublished cases is there a single instance of immediate recurrence of the perforation or of the perforation of a coexisting ulcer. Neither is there an instance of fatal hematemosis or hemorrhage from the sutured ulcer or any coexisting ulcer in either the stomach or duodenum. The consideration of the end results in these cases will be mentioned later.

On the other hand, in Brunner's statistics, comprising three hundred and eighty cases of gastric and eighty-six additional cases of duodenal ulcer, the following cases of secondary perforation (within one month, in contradistinction to remote), are mentioned (numbers refer to Brunner's bibliography):

CASE 1.—Case of perforation of a duodenal ulcer two days after the suture of a gastric ulcer (80).

CASES 2, 3, 4, 5, 6.—Perforation of a coexisting gastric ulcer, soon after (354), on the third day (270), on the fifth (118), on the seventh (289), on

the ninth (52), and on the twenty-first (297) day after operation for the original perforation.

CASE 7.—A case reported by Brunner, in which after the suture of a perforated gastric ulcer secondary perforation took place on the sixth day, just outside of the segment included within the suture.

Since the publication of Brunner's statistics, the writer has not been able to find a single instance in the literature in which this accident has occurred, and can only mention one instance (personal communication of Dr. Willy Meyer), in which a secondary perforation occurred six and one-half weeks after the closure of a perforation by suture only, with a fatal termination.

Secondary hemorrhage is also a very rare sequella after closure of a perforation by suture only. The following instances of this complication are mentioned by Brunner.

CASE A.—Hemorrhage on the twenty-third day after closure of a perforation, in which a part of the ulcer had not been included in the suture (352).

CASE B.—Hemorrhage occurring on the first day after perforation, in which the perforation was not found at the time of operation (214).

CASES C and D.—One case of eight days and one of one day (84 and 193), in which after suture of a gastric ulcer, a fatal hemorrhage occurred from a coexisting duodenal ulcer.

CASES E and F.—In these two cases of multiple ulceration (76 and 244) the source of the secondary hemorrhage could not be accurately determined.

CASES G and H.—In both of these cases fatal hematemesis occurred, no autopsy being allowed (23 and 349).

(To be continued.)

TRAUMATISM AS A FACTOR IN CANCER OF THE BREAST.

Traumatism has long been considered a factor of considerable etiological importance in cancer of the breast, but on investigation, the data upon which this belief rests is found to be far from convincing. For example, if trauma was an efficient cause of cancer we would naturally expect to find the growth developing in the portion of the breast most exposed to injury, as the nipple or areola. As a matter of fact the cancer appears most frequently in the upper outer quadrant which is less exposed to injury than any other portion of the breast, while the mammillary region, which is most exposed to injury, is almost immune.—ALFRED DE ROULET in *The Medical Standard.*

THE MANAGEMENT OF HERNIA.*

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Etiology.—Hernia is twice as common in males as in females. It is found at all ages, but oftenest before thirty-five years. In about one-third of the case there is a hereditary predisposition. Occupation also predisposes, especially muscular exertion undertaken when the thighs are flexed, as in lifting weights. It is in this position that the inguinal and femoral rings are most relaxed. Certain diseased conditions, such as chronic bronchitis, straining at stool, etc., are also contributory factors.

Clinically we adopt the following classification of herniae: reducible, irreducible, incarcerated or obstructed and strangulated.

The anatomical forms of hernia are inguinal, femoral, umbilical, ventral, obturator, lumbar, sciatic, perineal, pudendal and diaphragmatic. Only the first three will be discussed.

1. *Inguinal.*—This form may be direct or indirect. The indirect or oblique form may be congenital or acquired. The direct form is always acquired. In the congenital, which is always indirect, the hernial contents descend along the cord, usually in front of it, into the scrotum, where they surround the testicle. The tunica vaginalis forms part of the sac of the hernia. As the internal ring is not dragged down, the inguinal canal does not become shortened, the neck of the sac remains long and narrow and there is thus greater difficulty in reducing the hernia and greater danger from strangulation. There is also greater danger of reduction "en masse," one of the important dangers of taxis, which will be referred to again below. Congenital hernia is often complicated by a retained testis. Such children should not wear a truss until they begin to run about. The infantile hernia is distinguished from the congenital by the fact that there is a septum between the peritoneal cavity above and the tunica vaginalis below.

Diagnosis of Inguinal Hernia.—This is usually easy. It must be differentiated from a femoral hernia, hydrocele of the cord or tunica vaginalis, retained testis and inguinal adenitis or lipoma.

2. *Femoral or Crural Hernia.*—This form is rare before the age of twenty, is much commoner in women than in men, and is never congenital. The sac is usually small, but when it increases in size

* Read by invitation before the East Side Physicians' Association.

it often extends forward and upward above Poupart's ligament. The differential point is that the femoral hernia always lies to the outer side of the spine of the pubis.

Diagnosis.—Differential diagnosis must be made from inguinal hernia, femoral adenitis and psoas abscess.

3. *Umbilical Hernia.*—It may be congenital or acquired. The infantile form of acquired umbilical hernia is very common. It is due to a yielding of the cicatrix after separation of the cord. The congenital form is rare. The acquired form in adults is commonest in obese women who have borne children. It may attain great size and usually contains omentum and part of the transverse colon. Such herniae frequently become irreducible and strangulated. The infantile form rarely needs operative treatment—it can usually be cured by one of the many forms of truss or belt. The pad should not consist of a button, but should be large enough to overlap the hernial orifice by at least one-half inch all around. The treatment of reducible hernia is divided into palliative and radical.

A. *Palliative Treatment.*—This may be summed up into one word—truss. If the hernia be a small enterocele it may be well and comfortably retained for many years by a properly fitting truss, preferably one with a water or glycerin pad. The larger the hernial ring the more difficult it will be to retain the hernia. Obesity also renders it more difficult. It is easier to retain an inguinal than a femoral hernia, but easiest of all to retain is the umbilical hernia. If the hernia cannot be completely reduced, a truss should not be worn. A congenital hernia is more amenable to truss treatment than an acquired one. The younger the subject the better the chance of a cure by the truss. The best results are obtained in infants and children; the growth and development of their muscular system is an important factor in bringing about a cure. The truss consists of two parts, the pad which compresses the hernial opening and the spring or belt which holds the pad in situ. In many cases it will be necessary to have a double pad (even though the hernia be unilateral), as the single pad will often not remain well in place. The points of importance in a truss are that it should be light, firm and elastic, and it should comfortably retain the hernia in all positions of the body. If the pad does not sit well, if the spring is not strong enough, it will allow the hernia to slip out behind it. If the pressure is too firm it may cause an enlargement of the hernial opening or cause an inflammation. The truss should be applied before rising in the morning and should be worn continuously all day. In some cases, as in chronic bronchitis, or where the patient arises regularly during the night, it may be well to order a light truss to be worn at night. A waterproof truss can be made to be worn when bathing. The pad may be made of wood, hard rubber, or preferably consist of a bag filled with water or glycerine and covered with silk or leather. The size of the pad will depend on the size of the hernial opening. It should overlap the opening by at least half an inch all around. The pressure should be exerted at a right angle to the plane of the hernial canal. The spring of the truss passes around the body just below the iliac crest. If it is on the crest, the abdominal muscles will displace it; if much below the crest, the gluteal muscles will disturb it. From time to time the spring will require adjustment, either for the comfort of the patient or to properly retain the hernia. To test the efficacy of the truss the patient should strain in such positions as will most relax the hernial opening.

If the hernia cannot be well controlled or if in spite of the truss the hernia becomes larger, or if the patient refuses to wear the truss, then an operation is indicated. A patient should not be allowed to go about with a reducible hernia unless a truss is worn.

B. *Radical Treatment.*—The operative technic for the cure of inguinal, femoral, as well as umbilical hernia has been so much improved that we can now promise a cure in over 90 per cent. of our cases of reducible hernia. By using kangaroo tendon or chromicized catgut we can with impunity bury our deeper sutures without the risk of subsequent sinus formation. The use of silver wire and of silver wire filagree enables us to cure many otherwise improbable cases. The danger of infection in reducible hernia is almost nil and there should be no mortality. The old treatment of injecting an irritating fluid into the tissues about the neck of sac need be mentioned only to be condemned. The same applies to the injection of paraffin.

Irreducible Hernia.—This form is usually of long standing and often very large. The irreducibility may be due to the great bulk of the hernial contents, or to adhesions within the sac. Usually the hernia is partly reducible, while the remaining portion is bound down by adhesions. The longer a hernia is irreducible the more likely it is to cause pain, disturbances of digestion and to become incarcerated or strangulated.

Treatment.—As mentioned above, a truss should never be worn in such cases. A supporting bag, such as a suspensory, will give much comfort. The

bowels should be carefully regulated and exertion avoided. But such patients not only lead a very uncomfortable existence, but they also have a sword of Damocles continually hanging over them. At any moment the hernia may become strangulated and require immediate operation. An ocean voyage or a holiday far from civilization cannot be enjoyed with impunity. So that most of the cases, sooner or later, come to operation, and with our modern technic brilliant results are obtained.

Obstructed or Incarcerated Hernia.—This is most common in umbilical hernia and is usually due to constipation. The intestine within the hernial sac becomes obstructed by fecal matter and symptoms of intestinal obstruction result. We find it usually in herniae containing large intestine and especially in those that are completely or partly irreducible. On examination we find a tense tumor, which, the patient will tell us, is larger and much more painful than usual. Pain is usually moderate and colicky in character. In some cases there is no pain in the hernia, but the patient complains of nausea and a dragging sensation in the umbilical or epigastric region. There is moderate distention of the abdomen, perhaps vomiting and more or less constipation. The symptoms differ from those of a strangulated hernia in that the patient is less sick, there is no shock, vomiting is not severe, the constipation is not complete and the tumor not very tense.

Treatment.—Manipulation of the tumor does harm. The patient should be in bed, so placed as to relax the structures around the neck of the sac. An ice bag will be of use. An enema or rectal lavage will frequently give prompt relief. While the acute symptoms are present only water should be given by mouth. As soon as the acute symptoms subside a cathartic may be given.

Inflamed Hernia.—This condition is usually the result of an injury to an irreducible hernia, frequently femoral. The tumor becomes hot and painful; if it contains intestine considerable fluid will collect in the sac. In fact there is a local peritonitis within the sac. Vomiting and constipation are either absent or only slightly present. The symptoms are chiefly local and not very severe.

Treatment.—Rest in bed with a wet dressing or an ice bag over the inflamed area will usually cut short the inflammatory process. If an abcess forms it will require incision.

Strangulated Hernia.—In this, the most serious form of hernia, we have a condition that imminently threatens the life of the patient. There is (1) an obstruction to the passage of the gut back into the abdomen; (2) an obstruction to the passage of the contents of the gut; (3) an obstruction to the passage of blood to and from the strangulated tissues. It is found more commonly in herniae of long standing, especially during active adult life, is rare in childhood and in old age, but may be found in any variety of hernia at any time. Strangulation usually is due to the sudden descent into the sac of more than the usual amount of contents. Or it may be due to the swelling of the contents of the sac. In any case there is a compression of the hernial contents, usually at the neck of the sac. This compression causes a venous engorgement, which renders the parts still more swollen, and unless relief is promptly obtained strangulation soon results. The construction is usually at the neck of the sac, but it may take place at any point within the sac as the result of adhesions. Strangulation is rare in omental herniae, but common in intestinal herniae. The loop of gut involved becomes edematous from the venous congestion, its walls thickened, and deep red, later purple or brown, in color. Still later all circulation is arrested in the affected loop, the vessels become thrombosed and the gut gangrenous. In this stage the gut has lost its normal glistening appearance, its elasticity is gone and it does not contract when handled. There may be one or more perforations which took place spontaneously or as the result of taxis. The sac usually contains some bloody effusion and flakes of fibrin.

The symptoms of strangulation vary very much. We often find extensive strangulation without the patient even knowing that he had a hernia. The writer has operated on several such cases in which neither the patient nor the physician knew that there was a hernia present. Such patients, without any previous history referable to a hernia, will suddenly develop symptoms of intestinal obstruction. In these cases there is often no local pain to attract attention to a hernia, and the swelling is usually slight. They are frequently admitted to the hospital as cases of intestinal obstruction. In other cases there is pain at the seat of the sac at the outset of the strangulation; this pain may be mild or severe. The patient will sometimes volunteer the information that the rupture has increased in size, although this increase may be only slight. Handling of the sac is usually painful, the impulse on coughing is absent and there is often flatness or percussion, due to the accumulation of fluid within the sac. Signs of intestinal obstruction soon set in and nausea and vomiting, colicky abdominal pain and prostration; constipation, after the bowel below the point of strangulation has been emptied, is absolute.

The vomiting is usually frequent and persistent; in some cases, however, it is not a marked symptom and mistakes in diagnosis have occurred on account of its absence. As the attack progresses the abdominal pain increases, the patient is not able to retain any food, he loses strength rapidly, the eyes become sunken, the pulse is small and rapid and the urine much diminished in amount. As in appendicitis, when gangrene sets in, the pain diminishes or ceases. Here also opium will mask the important symptoms and, by causing delay in operating, sacrifice life. Where only part of a knuckle of gut is involved (Littré hernia) the lumen of the intestine is not completely occluded. The tumor may be so small as only to be found after careful examination. The symptoms may, at the start, not be so marked, as the intestinal obstruction is not complete; but if not relieved, gangrene of the gut will be just as certain to supervene; in fact, the gangrene develops more rapidly than if a large loop of gut is strangulated.

The prognosis without relief is almost certainly fatal. Death may take place in from two to fourteen days. It follows then that treatment must be prompt. Every hour's delay adds to the gravity of the disease. The prognosis improves in an inverse ratio to the length of time the gut has been strangulated.

There are but two methods of treatment, taxis and operation. To practice taxis the patient should be in the recumbent position. The muscles about the neck of the sac should be relaxed as much as possible. For an umbilical hernia the thighs should be flexed on the abdomen. For an inguinal or femoral hernia the thigh should be flexed and adducted. Raising the pelvis and lowering the shoulders will aid the manipulation. While the fingers of the right hand are exerting a gentle kneading and compressing of the hernial contents, the thumb and index finger of the left hand steady the neck of the sac. The amount of force to be applied should be slight and it should not be continued more than a few minutes. If the taxis is successful the gut can be felt to slip back suddenly and often with a distinct gurgle. The field of taxis in the old days was a very wide one. The fear of wound infection and of peritonitis made the physician persist long and energetically before resorting to the knife. As our operative technic improved, the field of usefulness of taxis became more and more narrowerd. Taxis should not be employed,

(1) In very acute cases where the symptoms have been rapidly progressive.

(2) In cases in which the hernia was previously irreducible.

(3) In cases of long standing, especially if taxis has already been attempted.

(4) In cases where gangrene of the gut or inflammation of the sac is suspected.

The dangers of taxis in any case of strangulated hernia are great, in many cases greater than the danger of operation. The great objection to taxis is that we are working in the dark. We do not know how badly strangulated the loop of gut is, and by exerting pressure with the hand we may cause a perforation of the gut. We may even succeed in reducing a strangulated loop only to find in twenty-four hours that the patient has a peritonitis from which he dies; or we may reduce the hernia en masse, *i. e.*, the entire sac with its contents is pushed back into the abdomen. If the seat of strangulation was at the neck of the sac, the symptoms will persist just as if no reduction had been affected. We have all seen lives lost by such unfortunate attempts at taxis—lives which could have been saved by prompt operation. So we have only too often at operation found gangrene of the gut undoubtedly caused by long continued taxis. And then it must not be forgotten that even if we are fortunate enough, in a few selected cases, to reduce the hernia, the patient is not cured. In a week or a month his life may again be endangered by the same condition. Here, again, we have an analogy to appendicitis. We may carry our patient through one or more acute attacks but the danger is ever present. One attack of strangulation, even if successfully overcome, should be a positive indication for operation.

The advantages of operation over taxis are:—

(1) None of the accidents attending taxis (mentioned above) is possible.

(2) The gut is inspected and is not returned into the abdomen unless it is viable—there is no danger of reducing perforated or gangrenous gut.

(3) A radical cure of the hernia can be done at the same sitting, thus preventing any future attacks of strangulation.

The details of the operative treatment will not be entered into. Suffice it to say that our results both as regards to saving life and curing the hernia are continually improving. During the eight years ending December 1, 1906, 190 cases of strangulated hernia were operated upon at Mount Sinai Hospital with fifty-three deaths, a mortality of about 27.9 per cent. Many of these cases were brought to the hospital late in the disease, after several days of strangulation, and in many of the fatal cases intestinal resection had to be undertaken. In cases operated upon during the first twenty-four hours after the onset, the mortality was extremely small; in

fact, the operative mortality will be found to go hand in hand with the number of hours that have elapsed since the onset of the strangulation. From this it will be seen that the presence of a strangulated hernia (which cannot be reduced by taxis), is an indication for immediate operation.

CONCLUSION.

(1) A hernia need rarely be operated on during the first few years of life, unless it cannot be controlled by a truss or, it becomes irreducible or strangulated.

(2) Taxis should be employed with the greatest care, not much force should be used, and it should not be persisted in for more than a few minutes.

(3) Operation is usually indicated in,

(*a*) A reducible hernia which cannot be well retained by a truss,

(*b*) An irreducible hernia,

(*c*) A hernia which has once become incarcerated or strangulated, even though it be successfully reduced by taxis,

(*d*) Every strangulated hernia that cannot be reduced by taxis.

We do not claim that a patient cannot live safely with a hernia that can no longer be retained by a truss, or that an irreducible hernia requires immediate operation. But we do believe that in the long run the greatest good to the greatest number will be accomplished by adhering to the above conclusions. In support of these conclusions it must be borne in mind that we can, to-day, promise a complete cure to over 90 per cent. of our non-strangulated cases. Furthermore, the operative mortality in these cases will be practically nil; whereas, the operative mortality in strangulated cases is at least 25 per cent. Further marked improvement in our operative technic is hardly to be expected. We can lower the mortality only by operating on more cases before the hernia becomes strangulated, and by operating at the earliest possible moment in the presence of strangulation.

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SURGICAL SEQUELAE OF INFLUENZA.

The hands are not uncommonly attacked, giving rise to swollen joints and tender nodes upon the fingers. Inflammations of the tendon-sheaths, muscles and bursæ in various localities also occur, as well as a form of non-suppurative orchitis closely resembling that of gonorrheal origin. Periosteal lesions, sometimes causing multiple nodes, may also appear upon the ribs and the skull.—LEONARD FREEMAN in the *Denver Medical Times.*

AN ARRANGEMENT FOR OBSERVING OPERATIONS.

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Another new arrangement for observation of operations has been instituted at the Red Cross Hospital, by means of which the amphitheater becomes not only entirely unnecessary, but the spectator seated in a chair can see the operation to its very minutiae from a distance as much as four hundred feet. This may be illustrated by the fact that the windows of the fourth floor of the hospital have to be screened in order to prevent people a block away from looking up and seeing the entire operation, for in several instances where that precaution has been omitted the police have had to disperse a crowd who had collected to observe the surgeon's procedure.

The idea presented itself to me after working with a reflex camera by which an object from an appreciable distance could be thrown upon a ground glass on top of the camera through the application of the mirror which stands at right angles with the center of the lens, throwing the received image upward. The same takes place, only in the opposite course, in the reflex mirror of the operating room. The table is so arranged that the largest field of operation is directly reflected upon the mirror. The mirror is about five feet in length and three feet in width, and hangs obliquely over the operating table about 7½ feet above the floor.

It hangs transversely to the operating table, the lower part being about even with the head of the table and the upper part leaning forward to form with the table an angle of about 75 degrees. The spectators can watch the operation from the seats, the first row of which stands about six feet away from the operating table. Opera glasses give the advantage of seeing the most minute part of the operation. The enucleation of a cataract or the removal of a gall-bladder can be seen as plainly as an operation upon a toe nail.

It sometimes occurs that the surgeon puts his head right over the field of operation. This, of course, obstructs the view for the moment, and in operations where this procedure is required, as in operations upon the eye or ear, it is necessary to place the patient in lateral position parallel with the mirror. By means of this arrangement the expense of an amphitheater is entirely superfluous. Moreover, every observer from an amphitheater must admit that he can see very little of the actual surgical work.

16 WEST 68TH STREET.

REPORT UPON THREE INTERESTING CASES OF SINUSITIS ASSOCIATED WITH SERIOUS EYE COMPLICATIONS.

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A great many publications by various authors, among the most recent those of A. Knapp, Posey, and Onodi, have called our attention to the close association which disease of the intranasal passages, especially that of the sinuses, play in connection with some of the more serious affections of the eye. A careful study of these sinuses has led to the unraveling of some of the problems which at times confront us in our ophthalmological cases.

The three cases reported in this paper presented themselves at the New York Eye and Ear Infirmary, Dr. Price's division, and are interesting from various points of view.

CASE I. T. A., male, aged seventy-seven, married. Has always enjoyed good health. He denies ever having had any venereal trouble. Alcohol and tobacco are only moderately indulged in. About six months ago he noticed a slight protrusion of the left eye. At first this protrusion varied in its extent; gradually, however, it began to increase in size, until it became very noticeable. From the very beginning there has been pain, but never severe. The pain, according to the patient's own description, has always assumed the character of a supra-orbital neuralgia. There is no history of a trauma. He states that he has been subject to attacks of hay fever every year, and that they have been especially severe in the autumn. A milder attack usually occurs in the spring. There has been present a slight discharge from his nostrils more or less at all times.

A physical examination brought out the following: Patient is a well nourished individual for his age and with excellent mentality. Heart shows the signs of a chronic myocarditis. The lungs and kidneys are normal. The vision in the right eye is 20/20; vision in the left eye 20/70. The latter cannot be improved by means of glasses. Pupil reflexes to light and convergence are good in both eyes. An examination of the fundus shows a senile cataract of the sclerotic type, more advanced in the left eye than in the right. The right eye is otherwise normal. There is a marked exophthalmos of the left eye. The motion of this eye is limited upwards and inwards, directly upwards, and slightly outwards. A distinctly defined mass is seen and felt at the upper and inner angle of the orbit. The orbital margin surrounding this mass is tender to pressure. One cannot insert his finger between the orbital margin and this mass, which shows distinct signs of fluctuation. On examining the nose, I found the middle meatus filled with a mass of polyps and muco-purulent secretion. It was impossible to probe the frontal sinus. Transillumination showed the area of the left frontal sinus dark, while that on the right side, in contrast, was well illuminated. I decided to remove the polypoid masses, and to resect the anterior end of the middle turbinated bone, hoping that this would afford me a better opportunity to probe the frontal sinus. This was done, and although the whole region was thoroughly cleansed, it was still found impossible to probe this region. It was decided that we should pass a needle into the mass, just below the inner and upper margin of the orbit. This was done and a syringe full of pus was the result. An examination by Dr. Dixon showed the pus to be sterile. We had, therefore, in all probability, to deal with a cold abscess, resulting from a frontal sinus empyema. The sterility of the pus in part explained the inability I had in probing the sinus. It certainly must have been closed off, or else the pus would not been found sterile. That a perforation of the sinus had taken place was evident from the exophthalmos. A radical operation was advised and accepted.

I assisted Dr. Price in performing upon this patient, under general anesthesia, a complete radical operation as advised by Grunert. Almost the first incision, through the soft parts down to the bone, demonstrated what we had to deal with. We found an empyema of the frontal sinus, which had broken through the floor of the frontal sinus, had found its way into the orbit, and had perforated the roof of the orbit, forming a large extradural abscess. The whole anterior wall and floor of the sinus were removed and also the supraorbital ridge, on account of the diseased condition of the bone. This ridge could not be preserved in this case. Remembering the suggestion of Grunert, that after all its removal is not attended by any greater deformity or interference of the superior oblique than is noticed after the Killian operation, the whole frontal sinus was obliterated. It was impossible to get into the nose through the fronto-nasal duct. This was found to be occluded by a mass of very firm tissue. No attempt was made to break this up, as we thought it wiser to let the wound fill up with granulation tissue. This we might naturally expect would take place, as the wound was firmly shut off from the nose, and there was no danger of infection from this source. The wound healed kindly, and closed with the exception of a small fistula, which lead to an area at the upper and inner angle of the original wound. As every attempt to close this fistula proved futile, a second operation was advised and accepted. I performed this at St. Luke's Hospital, one year after the first operation. At this second operation sufficient was found to account for the continued suppuration. This was removed and within two weeks the entire wound had closed.

Remarks.—A patient seventy-seven years of age suffering with a chronic myocarditis, and yearly attacks of hay fever, notices a gradually developing

exophthalmos of the left eye accompanied by pain of a neuralgic character. An operation is performed after the method of Grunert, and an empyema of the frontal sinus and an extradural abscess, are found. After a second operation for the cure of a stubborn suppurating fistula, the patient makes a comparatively complete recovery. There is still present, due to faulty healing, a narrow retracted passageway, which at times becomes eczematous and annoys the patient. This is of minor importance and can be remedied whenever the patient will admit of the slight operative procedure necessary.

In spite of the age of the patient he bore this operation without any ill effect. There is remarkably little deformity when one takes into consideration the amount of bone that has been removed. There is very much less than in most of the cases which are operated upon according to the method of Killian. As far as the diplopia is concerned, at the present time it is scarcely noticeable and does not annoy the patient in the least.

CASE II. T. S., male, aged 30; married; has two children. Has always been perfectly well and able to attend to his work. Could never see very well in the distance, but was told, and recognized the fact, that he was near-sighted. Drinks and smokes moderately. On May 27th, 1908, I had occasion to see this patient for the first time. At that time he gave me the following history. Two weeks previously, he had just been recovering from a bad attack of what he described as rhino-pharyngitis, when he made a trip to Ohio. He arrived there in perfect condition but on the following day noticed that the vision in the right eye, at times, was blurred and the left more so. Towards evening the vision in both eyes had grown very much worse, leaving him merely with the perception of light. When he awoke on the following morning he was absolutely blind. There was a dull pain over the mid-forehead region, but there was no symptom present to call his attention to any other portion of the body. The patient denies any excess of any kind at the time, and does not remember having eaten anything which might have produced intestinal disturbances, and thus account for an autointoxication. A physical and blood examination were made at once but they proved negative.

An examination of the eyes showed the following. He was completely amaurotic in both eyes. The pupils were dilated and did not respond to the light reflex. An examination of the fundus showed a low grade of optic neuritis with discs rather pale, more so on the right side. The veins were engorged and tortuous. An examination of the ears showed the effects of an old chronic adhesive catarrh, which the patient acknowledges has existed for a great many years.

The nose and throat were carefully examined. Both nostrils were filled with scabs and a mucopurulent secretion. This was much more in evidence on the right side than on the left. After the secretion and scabs were cleaned away, it was noticed that there was still secretion to be obtained from the region above the middle turbinated bone on the right side. Both middle turbinated bones were faulty in their position and not healthy in appearance. The throat showed all the evidences of a former ulceration. It was covered with scars. On close questioning the patient admitted that he had syphilis about twelve years ago, for which he had undergone thorough treatment.

A simple cleansing spray together with the use of adrenalin, and inhalations of the compound tincture of benzoin were prescribed, and the patient was carefully observed during the next few days. In spite of the energetic use of this treatment for four days, not the slightest improvement was noticed. I felt justified, therefore, in not delaying, and advised operative measures at once. At first the middle turbinated bone was resected and the post-ethmoidal cells on the right side curetted. Sufficient pus and detritus were removed to convince me of disease in this region, especially on account of the odor. In the sphenoidal sinus nothing was found, although as a matter of precaution I removed a portion of the anterior wall. Two days later the same operation was performed on the left side with still more evidence of disease in these parts. As the sphenoidal sinus was more accessible on this side and could easily be probed, and as no evidence of pus was detected, it was not interfered with. Within three days after the first operation the patient began to detect hand movements close to the right eye. The left eye still remained amaurotic. Cleansing solutions, together with an oily solution of menthol were frequently used during the day, and within a week's time the patient could count fingers at a distance of four feet from the right eye. The left eye, however, showed no improvement. The patient steadily improved in vision, until six weeks after the operative measures, his vision in the right eye with a 6 sph. + cyl. —1.50 Ax. 180° is 20/200. The left eye is completely amaurotic. The fundus shows that both nerves have suffered some atrophy. Especially is this the case in the left eye. During the last two weeks specific treatment has been carried out, but I doubt whether any improvement will take place in the left eye. In the right eye one might expect better vision, as the disc is only slightly pale. A central scotoma for white and colors is present.

Remarks.—I believe that in this case we had to deal with a combination of circumstances, viz., first an acute retrobulbar neuritis occurring in the canalicular portion of the optic nerve, brought about directly through a posterior ethmoiditis on both sides. Second, this occurred in nerves which I believe were already diseased through syphilitic infection. My reasons for believing this were that I had seen this individual almost directly after he became amaurotic. The discs at that time were pale and the arteries narrow, strikingly so on the left side, which I

believe favored the theory that the atrophy might have been in existence for a short time previous to the amaurosis. The rapid response to the surgical treatment, without any internal medication, could hardly leave any doubt that we were dealing with a closed empyema of the posterior ethmoidal region on both sides, as a complication to his previous trouble.

CASE III. E. D., female, nine years of age. The father of the child is living. The mother died in childbirth. All her sisters and brothers are living and in good health. This child had been perfectly well up to two weeks previous to the time that she had presented herself at the New York Eye and Ear Infirmary on June 17th, 1908. She had been attending school and there was not the slightest evidence of any disturbance in her vision. According to the description given by her sister, she had suffered from an acute coryza, which was attended by more or less severe frontal headache. This lasted about ten days, when she appeared sufficiently well to be up and about. She was given a ride on a trolley car. After she had been riding about twenty minutes she complained to her sister that she could not see well, and there appeared to be a slight blur before both eyes. This gradually became worse, so that by the time they reached home, the child appeared to have simply the perception of light. On the following morning she was absolutely blind.

Examination.—The little patient does not appear very robust, but on physical examination appears to be normal. There is no visible evidence of any syphilis or tuberculosis. She is completely amaurotic. Pupils do not respond to light. All the cranial nerves are normal. An examination of the fundus shows a double optic neuritis. The disc on the left side measures 5 diopters and on the right 4 diopters. The retinal veins are dilated and tortuous. An examination of the urine and blood is negative. As no other etiological factor could be found except the acute coryza, I determined to make a careful examination of the nose. The whole right nostril was filled with a mucopurulent secretion. The left nostril appeared to be free from secretion. The right nostril was cleansed and the tumefaction on the turbinated bones reduced by means of cocain and adrenalin. A purulent secretion immediately made itself evident from above the middle turbinated bone. Transillumination of the frontal sinus and the antrum showed nothing definite. There was some pain on pressure over the inner wall of the orbit on both the right and left sides, but no spontaneous pain or headache.

Again, in the absence of all other etiological factors except the acute coryza, together with the findings in the right nostril, absolute blindness occurring within a period of ten hours in a perfectly healthy child, with no history of hereditary syphilis and not the slightest evidence of any tuberculosis, and no evidence of anything which might point toward an autointoxication, it seemed to me that the cause of this disturbance should be sought for in the nose.

Sufficient was found to convince me of this fact. I did not feel justified, however, in a child so young, to remove the middle turbinated bones and attack the ethmoidal cells. It was thought best to employ milder measures at first. The child was kept at home. Alternately inhalations of the compound tincture of benzoin, menthol-abolene in the form of a spray, and cleansing solutions, were resorted to for treating both nostrils. Sweating and saline cathartics every other day. No internal medication was advised. Within forty-eight hours there was perception of light in both eyes but its projection was not satisfactory. On the fifth day after treatment the pupils began to respond very slightly to light and the projection and perception of light at four feet were good. Hand movements were detected. On the tenth day the child was able to count fingers at six inches. The swelling of the discs is less. Secretion is present now in both nostrils and while it was quite abundant at first, it is now gradually diminishing. Two weeks after treatment the child had begun to read letters and the vision in both eyes is 4/100. At the last examination, four weeks after the complete amaurosis, the patient's vision in both eyes was 20/70.

Remarks.—The latter two interesting cases were chosen from nine consecutive cases which I have observed during a period of two months. These two cases were chosen because the patients were completely amaurotic when first seen, and presented the most serious clinical picture.

In all the acute cases which I have had occasion to observe, symptoms of an acute rhinitis preceded the eye symptoms. Pain varying in intensity has been present in the majority of them, usually in the form of a dull headache. At times this pain is referred to a position back of the eye-ball. In one case the headache was so excruciating, attended by projectile vomiting and double choked disc, that I was inclined to believe that we were dealing with intracranial neoplasm. The rather sudden onset, with the complete absence of any focal symptoms, the decided relief and diminished edema of the optic papillæ after forty-eight hours of rest in bed, led me to reserve my opinion. This case proved to be one of posterior ethmoiditis.

Secretion is not always to be found in the nostrils. On the other hand, a faulty position of the turbinated bones, or a diseased condition of the mucous membrane will lead us to suspect that there is trouble in this region. Secretion eventually makes its appearance.

The acuity of vision in the majority of the patients is very much reduced. In some of the cases we meet with complete amaurosis. This loss of vision is very rapid. After the first evidence of any

disturbance, within forty-eight hours' complete blindness may be present. In most of the cases in which sufficient vision remains for the purposes of testing, a central scotoma for white and colors is present. In the first of the three cases reported in this paper, after the vision began to return, this central scotoma could be demonstrated.

The rapid response to the proper treatment is rather characteristic of this affection. One should be guarded in his prognosis, however, as some of the cases reported have shown no benefit from the treatment, and complete blindness has followed.

616 MADISON AVENUE.

PRACTICAL POINTS IN ANESTHESIA.

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(Concluded from the September Number.)

SYNOPSIS OF THE PREVIOUS CHAPTERS.

A description of a system in anesthesia as followed in the German Hospital in New York City. The anesthetic, whether chloroform, ether or anæsthol, is preferably administered by the drop method on a Schimmelbusch mask. A plea is made for the gradual induction of anesthesia as a means of avoiding cardiac and respiratory collapse, which are caused by crowding the anesthetic. A description of the proper plane of anesthesia and how to maintain it during operation. The value of the signs indicating the extent of the narcosis and the significance of the respiration, color of the ear, pulse, pupil, cornea, eyelids and secretions. The signs of awakening and the indications of the pharyngeal and ano-respiratory reflexes. Vomiting during anesthesia and how to treat this condition without resorting to the barbarous method of tongue traction. The author's method of overcoming obstructed breathing, caused by too great a concentration of the anesthetic; mechanical interference; valve action of the lips, or the tongue dropping back ino the oropharynx. For such emergencies the author advocates and employs a breathing tube of soft rubber 7¼ inches in length by 5/16 of an inch in caliber, which is introduced into the pharynx through the nasal route, thus admitting sufficient air to relieve the obstructed breathing. The indications for stimulation during narcosis is the loss of more than half the volume of the pulse. The influence of morphin on narcosis is the benumbing of the perceptive centers in the brain. Its administration requires the use of less of the anesthetic. An ideal narcosis should resemble a natural sleep with easy breathing and any change in its character demands attention. The signs of awakening are described and the simplicity with which a free, unembarrassed respiration can be restored.

AWAKENING.

If the narcosis has been conducted correctly the patient should become conscious promptly after operation. The premonitors of awakening are readily recognized. The corneal reflex becomes more active, the tonicity of the eyelid approaches the normal, a tear may appear in the eye, beads of perspiration are seen on the forehead, the patient may begin to mutter incoherently, the pulse becomes faster, the breathing loses its snoring character, the patient begins to move his head and awakes.

If the case is a laparotomy and the patient is under the influence of morphin-anaesthol, the narcosis is initiated by giving a drop occasionally when the surgeon puts his first sutures into the abdominal wall; after the fascial repair the anesthetic is stopped entirely. The narcosis may be so timed that the patient becomes conscious and responds to questions promptly after the last stitch has been placed.

If the morphin-anaesthol narcosis has been continued with *ether* by the drop method, as is frequently indicated, and if considerable ether has been used, the patient will be a little tardier in arousing, and the administration of the narcotic should be stopped at an earlier period. To be less abstract, in the case of a celiotomy the anesthetist desists at once from giving ether when the surgeon has applied the *peritoneal suture* for the closure of the abdominal wound.

RECESSION OF THE TONGUE AFTER NARCOSIS.

Sometimes, especially in individuals who show this tendency during narcosis, a marked obstruction in breathing is met with, attended by increasing cyanosis, a condition due to dropping back or recession of the base of the tongue into the laryngopharyngeal space. Changing the position of the head does not improve the breathing, the jaw cannot be pushed forward because the masseter is rigidly contracted and the teeth are closed tightly upon each other. To draw forward the tongue would require a rough procedure, with wedge, gag, and forceps. If a soft rubber catheter or the breathing tube be passed through the nostril into the pharynx the respiratory air streams freely through the tube.

POST-OPERATIVE DISTRESS.

Gas Pain.—Post-operative gas pain is often the source of great distress to patients who have undergone the ordeal of a laparotomy. It is due to a temporary paresis of the gut and consequent distention with gas. When the trouble is in the lower bowel considerable relief may follow the insertion of the rectal tube. Irrigation of the colon, when permissible, may stimulate peristalsis in the higher segments of the bowel. A routine intended to militate against intestinal paresis in celiotomies and worth a fair trial is to administer with the morphin sulphate a small dose of eserine sulphate hypodermatically. For the ordinary adult the dose should be about one-fourth of a grain of morphin sulphate and one-fiftieth of a grain of eserine sul-

phate given subcutaneously one-half hour before narcosis.

Vomiting After Anesthesia.—When it is important to avoid post-operative vomiting, gastric lavage with plain water, made faintly alkaline with lime water or milk of magnesia, may be done as soon as the narcosis is ended and while the patient is still on the operating table. During the procedure the head end of the table is lowered a few degrees.

I have gathered the impression that *crowding* is one of the prime causes of excessive vomiting after anesthesia. It has been my experience that cases in which I could truly say that I had not crowded the anesthetic and where it was not swallowed to any extent during the induction have suffered little or not at all from this disagreeable after-effect of the narcosis.

The attentive nurse will find that there are numerous little things, seemingly insignificant, that help greatly toward the patient's comfort. She may support the wound during a coughing spell or if the patient vomits. If her charge is tormented with nausea a piece of cotton saturated with a mixture of alcohol and acetic acid can be dropped into a tumbler and the patient allowed to inhale the vapor. If the lips and throat are dry and parched, moisture is grateful and small pieces of gauze wet with iced water may be laid over the lips and nostrils.

Post-Operative Pain.—If the patient is suffering after operation, one should be generous with morphin. It should always be given hypodermatically. To the adult less than one-quarter grain as a dose is of little avail. In post-operative cases there need be no fear of inculcating the morphin habit.

Morphin—Anaesthol Sequences.

For general use in every-day practice the morphin-anaesthol sequence, already described, is most satisfactory.

As indicated, the adult receives a quarter grain of morphin sulphate hypodermatically one-half hour before anesthesia.

Anaesthol, a fairly stable combination of chloroform, ether and ethyl chlorid in molecular proportions, is given by the drop method, but in slightly greater quantity than pure chloroform. For the average case of interval appendicitis, for example, about 15 to 20 cc. for the induction should be used, and 40-60 cc. for the entire anesthesia.

The morphin, in susceptible individuals, sometimes causes very shallow respirations so that the conduction of the anesthesia to the stage of unconsciousness becomes prolonged because the patient does not inhale sufficient of the anesthetic at each breath.

Crowding would be incorrect. The solution is patience, and a little *ether* to excite deeper respirations. The patient has but a slight stage of excitement, often none at all. This is continued until the first indication of free, unimpeded, snoring, respiration is heard, and then the surgeon may begin. Much of the narcotic is not required and the anesthesia can be so conducted that the patient promptly becomes conscious after the placing of the last suture.

Post-anesthetic distress is, on the whole, less marked than with pure ether. Not infrequently there is neither nausea nor vomiting.

Minor Anesthesia with Ethyl Chlorid.

In surgical office work there is occasionally the need of a rapid and fleeting anesthesia which does not necessitate the use of a cumbersome apparatus for its induction. In these cases, in place of chloroform, anaesthol or ether, the ethyl chlorid spray can be used on the Schimmelbusch mask, already described. It produces a prompt anesthesia, during which an abcess can be opened, washed and dressed without causing the patient the slightest pain.

Intubation Anesthesia.

In intubation anesthesia, or tube anesthesia, as it might be called, the patient does not receive the anesthetic directly from a cone or mask. The anesthetic is inhaled through a soft rubber tube, which is introduced into the pharynx through the nostril or mouth. It is most successful in cases which do not require a very profound anesthesia. It is indicated in operations on the head, enabling the anesthetist to be at a distance from the field of operation and out of the surgeon's province.

An important preliminary is to give the patient morphin sulphate gr. ¼ hypodermatically one-half hour before anesthesia is begun, as much less of the anesthetic is then required.

The method is simple. The anesthesia is carried to the surgical degree in the ordinary way with anaesthol or chloroform. A soft rubber catheter with an opening at the end and side and varying in diameter between ¼ and ⅜ of an inch is made smooth with sterile vaselin and then passed through the nostril down into the naso-pharynx, for a distance of about 7¼ inches in the adult, to the vicinity of the larynx. If the respiratory air streams freely through the tube it is assumed to be at the proper level and the tube is anchored and held in place by making a single turn of zinc oxide adhesive plaster about it, near the nostril, and fastening the ends to the cheek. It is important that these straps adhere firmly and the skin should therefore be cleaned

with a little ether or chloroform before they are attached. This naso-pharyngeal tube must now be connected with a second tube, the *conducting tube,* to which a perforated funnel covered with gauze is attached, or which is dipped into a tumbler containing loosely packed gauze; the conducting tube should lie by the side of the patient, beneath the sterile sheets and be so long that the anesthetist can sit at the foot of the operating table to administer the anesthetic.

Catheters, a piece of rubber tubing, some zinc oxid plaster and a tumbler containing some gauze, are, therefore, all that one needs in order to improvise, in a few minutes, an adequate intubation apparatus. In practice, simplicity is frequently important.

Cocainization of the Pharynx Is an Unnecessary Procedure.—For operations on the mastoid or brain the pharynx need not be tamponed about the tubes. This is done only when blood is apt to flow down into the air passages, as in resecting the upper jaw, or Kocher's excision of the tongue and various *intrabuccal* operations. In such cases the Roser mouth gag is inserted and the tongue drawn gently forward out of the way, while, aided by the index finger of the right or left hand, a piece of gauze tampon is placed snugly about the naso-pharyngeal tube or tubes. If a stream of expiratory air issues from the tube it is certain that the pharyngeal openings in the tube have not been plugged by the tampon or tenacious secretions. In certain operations on the nose where *both* nostrils are involved it becomes necessary to introduce the tubes through the mouth—oro-pharyngeal intubation.

The anesthetist need not be at sea, although he is at a considerable distance from the face and eye, which he is accustomed to watch with such care during narcosis. In any case, the *pupil* is no longer a very useful guide because the patient has received morphin. There is access to the pulse at the wrist or the dorsal artery of the foot and its regularity and quality can be noted. A *diffuse* and *weakening* pulse wave is at once appreciated as a danger sign —too much chloroform—and the tube should be disconnected from the funnel to admit pure air, until the pulse has recovered its quality.

The color of the face can be observed; also the breathing movement of the chest and abdomen; and the respirations are readily heard through the tube. Any change in the character of the breathing or any hindrance in inspiration or expiration is readily detected. From time to time the funnel is disconnected and fluid which may have accumulated in the tube, as, for instance, condensed anesthetic, is allowed to flow out.

Secretions clogging the pharyngeal end of the tube are expelled by "milking" the tube, that is, forcing an occluded column of air through it by stroking it between the finger and thumb in a direction toward the patient, or allowing a gentle stream of oxygen to flow into its lumen.

As long as the breathing remains unembarrassed and regular, the pulse is of good quality and a general, passive condition maintained, the patient is in the normal surgical plane of anesthesia and any interference would be meddling.

CASES REQUIRING SUPERFICIAL ANESTHESIA.

(1.) Supra-pubic prostatectomies and cystotomies after the skin incision is made.

(2.) Nephrectomies in general, but especially in tuberculous and enfeebled women.

(3.) Mastoid and brain operations.

(4.) Osteotomies and operations on the extremities.

(5.) Curettages and obstetrical manipulations.

CASES REQUIRING ANESTHESIA OF MODERATE DEPTH.

(1.) Trachelorrhaphies. Colporrhaphies and perineorrhaphies.

(2.) Stretching of the sphincter and hemorrhoids.

(3.) Resections of the rectum by the perineal or sacral route.

(4.) Perineal prostatectomies.

(5.) Inguinal and femoral herniotomies.

CASES REQUIRING PROFOUND ANESTHESIA.

(1.) Gynecological laparotomies; salpingo-oophorectomies and hysterectomies.

(2.) Operations on the stomach or gall-bladder; gastro-enterostomies, cholecystectomies.

(3.) Orthopedic manipulations necessitating complete muscular relaxation; reduction of congenital dislocation of the hip.

CONCLUSION.

Anesthesia is a science which deserves more attention.

The extensive use of ether and the experience that its incautious administration is fraught with but little immediate danger has gotten the hospital interne into reckless habits which cling to him in practice. There the anesthetist finds himself frequently compelled to use chloroform, a narcotic many times more powerful than either. In the hands of the inexperienced and, above all, the inattentive, chloroform is certainly a dangerous drug. But this does not retract from its great value as an

aesthetic and it would be illogical to condemn its use.

In the aged, we know that it is often not so much the operation itself, as the broncho-pneumonia that follows the anesthesia which deserves grave consideration. Chloroform, or the chloroform-ether combination, such as anesthol, is undoubtedly, in such cases, preferable to pure ether, because it causes less bronchial irritation. In the morphin-anaesthol-ether sequence which I have tried to outline, chloroform and ether are blended in a way most adequate for anesthesia, and the system is so flexible that it readily adapts itself to an anomalous case.

The difficulties in respiration, so frequently encountered, even by the experienced anesthetist, find a natural solution; if he has been studying the case he will be able to judge whether the trouble is due to crowding or to a mechanical cause.

I have no hopeful word for the anesthetist who is inattentive. It should be remembered, whether the case is an apparently simple or critical one, that the good anesthetist, just as the good surgeon, is he who, besides being competent, has a conscience, and feels his responsibility; who appreciates that *there are some who are anxiously awaiting the outcome and have a deep interest in the life that is in his hands.*

CHOLECYSTECTOMY.*

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With the rapid strides made in the surgical treatment of diseases of the upper abdomen within the last decade, we are very much inclined to view the immediate results obtained, while very little is said of the final conditions resulting therefrom.

Twenty-six years ago Langenbuch, of Berlin, proposed and carried out the operation of cholecystectomy, operating upon twelve patients, two of whom died. The operation, however, was not given the necessary impetus, probably owing to the lack of recognition of the pathologic indications for the operation, together with its high mortality.

During the past twenty years the temporary relief of symptoms has been met with by simple incision and drainage, very little attention being paid to the pathologic condition of this organ. Can we then affirm that in this class of cases we have left the function of the biliary tract in as nearly a normal condition as possible?

We fully realize that removal of the gall bladder does not cure cholelithiasis, neither would we be understood as advocating cholecystectomy in all cases of gall stones. However, it is not to be denied that gall stones have frequently been the initial cause which has induced subsequent pathologic changes in the gall bladder. These changes which will prevent restoration of the normal function of the organ mentioned, and which would call for a cholecystectomy, are referable either to the viscus itself or to the cystic duct.

Among the pathologic conditions of the viscus which will indicate a cholecystectomy are adhesions of the gall bladder to other organs such as the stomach, colon or omentum which are likely to recur after being broken up; injuries of the gall bladder, such as perforation from gangrenous or phlegmonous cholecystitis, or stab or bullet wounds; chronic cholecystitis, where the walls are thickened, or where, by reason of ulceration, we find that scar tissue has supplanted part of the muscular coat; fistulæ communicating with the skin or neighboring organs; cystic empyema of long standing, in which the walls of the bladder are irreparably diseased; hydrops of the gall bladder, where obliteration of the cystic duct renders the gall bladder not only useless, but serves as a continued menace to life from its liability of reinfection or even rupture; and in malignant disease of the organ.

The pathologic conditions of the cystic duct calling for ablation of the gall bladder are the following: An impacted calculus, causing the lumen to become obliterated by cicatricial contraction following inflammatory changes; fistulæ opening into the stomach, duodenum or colon; in irreparable ulcerative condition of the walls of the duct; and in cases of stricture of the duct.

In those cases in which any of the conditions just enumerated exist, incision and drainage will give but temporary relief and a subsequent recurrence of the symptoms or a persistent fistula with its many disagreeable features will be the final result. Even if drainage is absolutely indicated, it is quite an easy matter to drain the ducts after removal of the gall bladder, and in fact, the technic usually employed will allow such drainage, if indicated.

The removal of the organ in these cases overcomes the need for drainage, and in very few cases in which drainage may be necessary the exception only prove the rule.

Although we favor conservatism and do not believe that we should unnecessarily sacrifice such an organ providing it is capable of draining itself, neither do we believe that it should be retained in

* Read before Connecticut State Homeopathic Society, Hartford, Conn., May 19, 1908.

those cases in which it is liable to become a favorable nidus for infection and the further development of calculi.

When we consider that it is in the gall bladder that the greater number of gall stones are formed, and that their very presence favors the development of inflammatory changes and infection, is it not a logical conclusion that the operation of cholecystectomy will be found to yield to best ultimate results? Even the presence of stones in the common duct does not contraindicate the removal of the gall bladder, if it is badly diseased.

In primary carcinoma of the gall bladder, cholecystectomy is, unquestionably indicated. Moynihan has called attention to the fact that 95 per cent. of the cases of malignant change is due to the chronic irritation from gall stones.

Robson has recorded a case upon which he performed a cholecystectomy, and eighteen months later was compelled to remove the gall bladder for carcinoma.

As a rule, when a diagnosis of carcinoma of the gall bladder may be positively given, it is then too late for a radical operation.

A great deal has been said and written of the increased mortality of cholecystectomy over that of simple incision and drainage, which we believe is not well substantiated.

The class of cases which have heretofore necessitated ablation of the viscus were serious ones, and we certainly should expect a higher mortality than in those cases in which a cholecystectomy seemed to meet all the requirements.

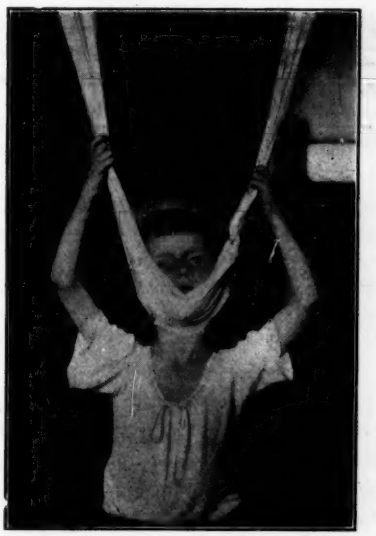
THE RIGHT UPPER ABDOMINAL QUADRANT.

It is never easy, and often impossible, to make a diagnosis of the various conditions found in this quadrant, during their early stages. No combination of symptoms is typical of any one condition. Here errors of diagnosis are not made from insufficient knowledge or lack of ability in making an examination; but rather to wrong interpretations. The clinical signs here presented require much judgment for their proper interpretation and hence it is necessary not only to consider the whole syndrome, but to take careful account of everything that enters into the history, development, duration, and to employ all methods at our command for our keenest observation; for often a correct diagnosis hinges upon some apparently small detail. Each symptom must not only be carefully weighed, but the patient's general condition must invariably be considered. —H. E. LOMAX, in *Albany Medical Annals.*

AN EASILY CONSTRUCTED SLING FOR THE APPLICATION OF THE PLASTER JACKET.

SIGMUND EPSTEIN, M.D.
NEW YORK CITY.

A double strip of unbleached muslin six inches wide is seamed together at its edges; the ends are sewn together forming a sling or swath about four yards long. The swath is slung over two screw-hooks which can be fastened into the top of a doorway and about eighteen inches apart. The swath is slung on these hooks in such a manner that the two loose folds will support the chin and occiput of the patient. A safety pin on each side fastens the two folds of the swath just below the ear.



Before putting on the jacket a block or thick book should be placed for the patient to stand on, to be removed after the swath is adjusted, so that the patient stands on his toes.

The advantages of this sling are:

(a) Cheapness.

(b) Convenience in putting together, requiring no iron work or pulley or rope.

(c) Cleanliness, as the secretions from the mouth and nose of the little patients usually soil the apparatus that is in general use.

591 LEXINGTON AVENUE.

THE VALUE OF PALPATION IN SURGICAL DIAGNOSIS.

That a man who thinks with his fingers, and feels daily with every opportunity, may acquire a sense of touch so skilled that he can detect thickening, displacement, distortion, deep in the recesses of the body, I firmly believe.—HAL WYMAN in the *Journal of the Michigan State Medical Society.*

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, OCTOBER, 1908.

SUBTEMPORAL DECOMPRESSIVE OPERATIONS IN THE TREATMENT OF BURSTING FRACTURES OF THE CRANIAL BASE.

The most striking addition to cranial surgery suggested within the past year, is that advised by Cushing at the last meeting of the Southern Surgical and Gynecological Association (*Annals of Surgery*, May, 1908). As a result of a trial of three years with this original procedure he recommends the performance of subtemporal exploration and decompression in cases of bursting fractures of the cranial base. These fractures are almost always accompanied by serious brain symptoms (by which, presumably, the character of the fracture is recognized)—symptoms, as Cushing points out, that are due to compression. Increased blood pressure, slow pulse, headache, vomiting and choked disc constitute the syndrome of compression, and to these, of course, focal symptoms may or may not be added.

Briefly stated, Cushing's procedure consists in an obliquely vertical temporal incision, splitting of the temporal muscle, removal of a circle of the thin bone, and opening the dura. Drainage of blood extravasation and ligation of the middle meningeal are performed, as indicated, but, in any event, decompression is provided for. The advantages of this mode of decompression are those emphasized by Cushing in connection with brain tumors. In addition, it possesses obvious anatomical advantages in the exploration of these basilar fractures.

The usual treatment of fractures of the base of the cranium is essentially "expectant," and it must be contended that many such cases make excellent recoveries. These are, however, usually simple fractures with such comparatively mild symptoms as bleeding from the ear, mouth or nose, ecchymosis of the eyelids, and evidences of concussion or contusion that are distressing but brief. In such cases, we take it, Cushing does not urge the performance of his operation, although he says that "less risk is run even in the milder or borderline cases by a prompt exploration and decompression, than in waiting for nature to take her own course. . . ."

As compared with his previous mortality of about fifty per cent. in cases of basal fracture, Cushing has lost in his last fifteen cases, treated, presumably, by subtemporal decompression, but two—both cases in which only a unilateral exploration was performed, and an extensive extravasation on the other side was overlooked. Coming to us from such an expert source, and based upon such good results in his hands, this operation seems to deserve a careful trial in those cases which, otherwise, usually die—or sometimes recover "more by good luck than good management."

SALIVARY CALCULUS.

Sialolithiasis is not one of the common human disorders, for which reason, perhaps, and also because a salivary calculus may be present for some time without causing more than slight discomfort, it not seldom escapes diagnosis until a sharp inflammatory condition proclaims its presence. Such a stone is more often found in Wharton's than in Steno's duct, both because the submaxillary gland secretion is less watery than that of the parotid, and because its duct, structurally and by location, is more exposed to trauma.

For a long time a salivary calculus may produce only a peculiar sensation of discomfort when eating. Sooner or later, unles the stone be so small that it escapes from the mouth, it causes intermittent swelling and pain in the region of the gland. These attacks may also be mild and brief, until infection and suppuration take place, when the pain and swelling become severe enough to direct the sufferer to his physician.

At first glance the condition may be mistaken for an acute submaxillary lymphadenitis, but an examination of Wharton's duct will correct the diagnosis.

for if pus can be massaged from it, or sucked from it by the patient, the salivary gland is plainly at fault. The history of intermittent swelling is in itself very suspicious. Finally, the stone may usually be felt in the floor of the mouth or located by means of a slender (lacrimal) probe.

A few minims of a local anesthetic injected over the calculus renders its removal easy through a slit in the duct. Attack upon the gland itself is needed only when the stone is there situated, or when, as occasionally happens, the gland inflammation has progressed so far that removal of a duct stone does not cure it.

SOME LESSONS FROM ANCIENT FRACTURES.

Enthusiastic chroniclers remind us of the "wonderful progress" of medicine so often, especially at this season of the year, that it is difficult to realize that anything of importance in medicine was known before the past few decades. In such periodic exacerbations of medical conceit, it is altogether fitting to be reminded that a considerable knowledge of medicine was possessed by our forefathers, even at a time when the literature of medicine had not begun; and furthermore that in one important field of medicine, fractures, their knowledge compares very favorably with that of the present. In a recent number of the *British Medical Journal,* August 22, 1908, F. W. Jones reports his examination of the bones of 6,000 bodies, collected in the course of excavations in ancient Nubia, representatives of a period dating from 4,000 B. C.—the earliest period from which human remains have come down to us—to the 5th century after Christ. Taken altogether, Jones concludes that "the results of union of bone are quite as good as those obtained by the surgical treatment of to-day; in many instances they are probably even better." As instances, the author mentions the fact that in fractures of the femur practically no deformity resulted, and that the average shortening was only 11 mm.; whilst in the case of the humerus the broken bone was frequently only three mm. shorter than its uninjured fellow.

It is also of interest to note that the relative frequency of various fractures corresponds closely to statistics compiled at the present time. The most striking difference is seen in the figures relating to fractures of the bones below the knee and of the hand. This is accounted for, first by the absence of stairs, pavements and curbstones in those times, and second, by the absence of machinery.

This report well pays perusal, and bears an interest that is more than purely historical.—E. M.

Surgical Suggestions

W. M. B. H. M. H.

The sensation of a foreign body in the eye may be provoked by the presence of a small tarsal tumor.

A periostitis at the margin of the orbit may resemble a cellulitis. It is often of syphilitic origin.

It is worth while bearing in mind that subcutaneous swellings are sometimes gummata.

Frequent applications of tincture of iodine on a "tooth-pick" swab will often heal a corneal ulcer where other means fail.

When a patient complains of pain in the eye with epiphora, don't always think it is due to conjunctivitis. The cause may be a beginning glaucoma.

Persistent furunculosis and allied suppurating skin lesions appear to yield in a large percentage of cases to Wright's vaccine treatment. Stack vaccines are usually suitable to such cases. The internal administration of yeast, calcium sulphide, etc., affords only occasional help.

After an operation for extensive carbuncle of the neck, a comforting support may be supplied by placing under the bandage a piece of heavy manila cardboard (book-binders' board), wetted and shaped to the back of the head and neck.

If a scalp wound extends through the periosteum it is safest to sew the periosteal wound at once and leave the scalp unsutured for twenty-four hours. Fracture should be excluded, if possible, before closing the periosteum.

A small meningocele may resemble a sebaceous cyst. The previous history is important in the diagnosis. A meningocele of this character is present "as long as the patient can remember" and remains about the sime size; a cyst begins as a small nodule later on in life and increases in size.

A small, hard, irregularly nodular scalp tumor is very likely an endothelioma. A little section should be removed under local anesthesia for microscopical examination. If the diagnosis is corroborated, radical removal is necessary.

Book Reviews.

Diseases of the Breast, with Special Reference to Cancer. By WILLIAM L. RODMAN, M.D., LL.D., Professor of Surgery in the Medico-Chirurgical College of Philadelphia and in the Woman's Medical College of Pennsylvania; Surgeon to the Medico-Chirurgical, the Philadelphia General, the Jewish, the Presbyterian and the Woman's College Hospitals, etc. Octavo; 385 pages; 69 plates and 42 other illustrations. Philadelphia: P. BLAKISTON'S SON & Co., 1908. Price, $4.00 net.

As a manual this work is an acceptable addition to our surgical text-books. As a treatise—with which title it is dignified in the preface—it is quite unworthy of its distinguished author. It is neither profound nor exhaustive, it is almost lacking in references to the literature, and it is marred by an unfortunate style. The latter is in part a rather inelegant literary construction, and in part a distressing profusion in the use of the first person singular. The pronoun *I* fairly bristles from every page. The author has allowed his effort to incorporate his own observations and deductions, to draw him into the fault of enunciating surgical platitudes with all the argumentative force of personal beliefs. This form of statement, occurring again and again throughout the book, cannot but mislead the medical student into thinking that many of the accepted data of mammary diseases are still under debate. A critical editing of the book before it went to press might have corrected this fault, as well as some minor ones of a purely literary character. It might have eliminated, from page 284, a bit of medical slang, "I prefer fine Pagenstecher for ligatures,"—excusable, perhaps, in ordinary conversation, but certainly not to be pardoned in print. It would have called the author's attention to the marked inadequacy of his index. And incidentally, it might have pointed out some gross typographical errors, *e. g.,* on page 15 "perfectly" should be "imperfectly," on page 39 "involuntary" should be "involutionary," on page 98 "a was" should be "was a," on page 16 "Gailliard" should be "Gaillard."

After a preliminary section on *anatomy and physiology,* written by Dr. Charles W. Bonney, the author discusses *inflammatory diseases of the breast*—engorgement, acute and chronic mastitis, and acute and chronic abscess—in a chapter of 16 pages. These subjects deserve more space in a monograph. In the treatment of abscesses, both acute and chronic, Rodman unreservedly advises *free* incision and drainage. He makes no reference whatever to the employment of small incisions and cupping. The therapeutic value of Bier's hyperemia has by no means been satisfactorily demonstrated; but there is no doubt that the management of breast abscesses, as elaborated by Bier and Klapp, often obviates mutilating scars and prolonged treatment. At any rate, this method is now being actively tested, and a "treatise" on diseases of the breast, published in 1908, should not have failed to refer to it.

The succeeding sections deal, very concisely, with *tuberculosis, syphilis* (by Bonney), *actinomycosis, cysts, diffuse hypertrophy* and *keloid,* respectively.

The remaining 270 pages are devoted to *tumors.* Ribbert's classification is employed as introductory to the subject from the pathological standpoint. For his own schema Rodman adopts the classification of Warren, to which he makes some additions, notably that of pure adenoma. The benign tumors are well described, but rather more clearly from the histological than from the clinical standpoint. The operation of plastic resection of the breast is described and illustrated with the plates used in Warren's original article.

The subject of *carcinoma* occupies rather more than half the book, and of this space most is devoted to treatment. The history of the various steps of the modern radical operation is interestingly related, the author's personal association with the late S. W. Gross adding much to the charm of the narrative. It was quite worth while to have incorporated this sketch, apportioning to each surgeon, American and foreign, his proper credit in the evolution of the operation.

Rodman emphasizes the importance of enucleating doubtful growths for frozen-section diagnosis, although his description of the procedure as he performs it might create the impression among the unknowing that it is not done in the same manner by other surgeons. He also, quite properly, insists on the importance of early diagnosis and operation in breast cancer, but he devotes to this argument more space than is necessary in a monograph intended for colleagues.

The author's plan of operation, which possesses original features, is described in detail, and illustrated by excellent plates, as are also the operations of Tausini and Jackson and the plastic amputation of Warren. The important steps of Halsted's and Willy Meyer's operations are described.

In all cases in which the growth is peripheral and occupies the upper portion of the breast, or in which the space of Morenheim is invaded, Rodman explores the supraclavicular space through a separate incision (he never resects the clavicle) and sacrifices all of the pectoral muscles. In other cases the clavicular portion of the pectoralis major is not removed. He employs only blunt dissection of the upper part of the axilla, which is exposed by a single straight incision and division of the muscles. He urges a *free* oval or circular incision for the removal of the breast; and he lays stress on the importance of undermining the surrounding skin and removing much of its underlying fat and fascia. He drains anteriorly as well as posteriorly.

The clinical usefulness of this work would have been increased if it contained a separate section on the proper examination of the breast and axilla—a subject dismissed by the author with a page (242) tucked away in the section on carcinoma, and not referred to in the index—and on the differential diagnosis, clinically, of the various breast tumors—which latter subject Rodman touches on only in a fragmentary and superficial manner.

Anatomy, Descriptive and Surgical. By HENRY GRAY, F.R.S., late Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School, London. *Seventeenth Edition.* Thoroughly revised and re-edited, with additions by JOHN CHALMERS DA COSTA, M.D., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia; and EDWARD ANTHONY SPITZKA, M.D., Professor of General Anatomy, Jefferson Medical College. Royal octavo; 1,614 pages; 1,149 illustrations. Philadelphia and London: LEA AND FEBIGER, 1908. Cloth, $6.00, net; full leather, $7.00, net.

A critique of Gray's *Anatomy* can be written in but one word—masterpiece. A critique of its revisions should be chiefly to determine whether the editors of that masterpiece have approached their task in the affectionate and reverent spirit with which, for the last half century, every English and American medical student has held his "Gray"!

In the last issue of *The American Journal of the Medical Sciences,* Frank K. Boland contributes a most interesting Biographical Note of Henry Gray, from which we take the liberty of quoting:

"Gray's signature appears on the pupil's book at St. George's Hospital, as entering on May 6, 1845, as a "perpetual student." This term, although probably customary, serves to illustrate the earnestness with which the eighteen-year-old youth took up his chosen work. . . .

"In 1848, at the age of twenty-one years, he was awarded the Triennial Prize of the Royal College of Surgeons of England, for a paper on 'The Origin, Connection, and Distribution of the Nerves of the Human Eye and its Appendages, Illustrated by Comparative Dissections of the Eye in the Other Vertebrate Animals.'

"On June 3, 1852, he received the distinction of being elected a Fellow of the Royal Society at the remarkably early age of twenty-five.

"Gray won the Astley Cooper Prize of three hundred

guineas in 1853 for his dissertation on "The Structure and Use of the Spleen," a work which ranks next in importance to his *Anatomy*.

"From 1853 to 1858 he was lecturer on anatomy at St. George's Hospital. . . . Gray now devoted his energies to the preparation of . . . the masterpiece, *Anatomy, Descriptive and Surgical*. . . . The idea exists that no good books on the subject had been written before. Nothing could be more erroneous. Many excellent anatomies were in common use at the time Gray's made its appearance, and the new work was pitted against keen competition. . . . Gray undoubtedly felt that there was room for improvement in these treatises, particularly in the matter of arrangement and illustrations. He had a good conception of the principles of pedagogy, and desired, in so far as he could, to smooth for his students the hard road to anatomical knowledge. . . . It was not the presentation of any new anatomical discoveries, but the clearer and more systematic presentation of old ones, backed strongly by unparalleled drawings, which secured for his book its phenomenal success. To Dr. H. Vandyke Carter, who made the drawings, a large part of the credit for the success of the work must be given."

Aside from their clearness, these illustrations were immediately preferred over those in other works, because the names of the various tissues were engraved directly upon the representation of those tissues. Gray was also the first to employ colors. The engravings, the nice descriptive, and the annotations on surgical anatomy were the features that brought Gray's work to the preeminent position it has always maintained.

"The first edition was published by John W. Parker & Son in 1858, and was the only edition that Gray ever saw. The book was a success from the first.

"He was at work on the second edition of his book at the time of his death (1861), and had made good progress with a work on *Tumors*."

"Surely a man must have been very little short of a genius to have written in his time the book he did at the age of thirty-one years. To-day most of us have only begun to live at thirty-one; but Gray had accomplished more at that age than the great majority of us can hope to accomplish if we live twice as long."

This, the seventeenth edition, has been prepared by two men well qualified for so serious an undertaking—Professor John Chalmers Da Costa, the last edition of whose *Modern Surgery* is the best American work on that subject, written in a single volume, with which we are familiar; and Professor Edward Anthony Spitzka, son of a brilliant father, artist as well as teacher, one of the youngest of prominent American anatomists and a notable contributor to, especially, neural anatomy.

In its present form Gray's *Anatomy* is more than twice its original size. Yet it is still "Gray." It would indeed be difficult to edit the master out of the masterpiece! There are the familiar illustrations, the familiar text and headings, the familiar diagrams illustrating the relations of arteries, etc. Yet much has been added. Many new illustrations have been introduced. While they are, for the most part, easily distinguishable by their execution from those in the original work, it is only fair to say that, like the original cuts, everyone is exceedingly clear and possesses a distinct didactic value. No violence has been done to the familiar English and bastard Latin nomenclature. An adoption at once of the, to-be-sure more desirable international terminology, would have been confusing to old students of Gray's and other English anatomies. As in previous editions, the Latin names have been inserted in parentheses after the others. Here and there, however, will be found accepted modification of an older title.

The description of the heart has been taken from the section on the viscera and placed where, from the dissector's standpoint, it more properly belongs, with the anatomy of the vascular system. The section on the nervous system shows the greatest amount of revision, especially in the anatomy of the brain and spinal cord. This department, by reason of the many additions to our knowledge since Henry Gray's death, is the only one in which it might be said that the older editions were inadequate. The preparation of this section on *The Nerve System* is Spitzka's chief contribution to the edition. He has thoroughly revised and, indeed, largely re-written it. The illustrations here are most of them new to this work, many of them original and all excellent.

The résumés on histology and embryology, and the notes on surgical anatomy are brought up to date. In the text itself there is ample evidence of thorough, painstaking revision. The work of the two previous editors—T. Pickering Pick in England and W. W. Keen in America—has obviously been helpful and suggestive.

This edition represents a marked expansion of the last one and a decided improvement in illustrations and in detail. It will no doubt be serviceable for many years to come. The house of Lea has cherished the publication of Gray's *Anatomy* for many years. The seventeenth, like their earlier editions, is eloquent of their effort and their care.

Diseases of the Rectum, Anus and Sigmoid Colon. By F. SWINFORD EDWARDS, F.R.C.S., Senior Surgeon to St. Marks Hospital for Diseases of the Rectum; Surgeon to the West London Hospital, etc. *Being the Third Edition of Cooper and Edwards' Diseases of the Rectum and Anus.* Octavo; 442 pages; 102 illustrations. London: J. & A. CHURCHILL. Philadelphia: P. BLAKISTON'S SON & Co., 1908. Price, $4.20 net.

The second edition of this book was published sixteen years ago. In order to bring the work up to date the author has practically rewritten it, adding many new chapters, notably those in Procidentia Recti and Sigmoidopexy. Many new illustrations and cases have been added to the chapter on Fistula, and the description of the horseshoe and semi-horseshoe fistulae has been amplified.

The chapter dealing with hemorhoids, fistulae and malignant disease should be especially noted. The author advocates the Salmon operation for hemorrhoids as being most expedient, although the majority of operators in this country prefer the clamp and cautery to the cutting operation.

The photoengravures and text are excellent. The book will form a valuable addition to the specialist's library, containing as it does the practical results of an experience of over thirty years in this line of work.

Hygiene for Nurses. By ISABEL MCISAAC, Formerly Superintendent of the Illinois Training School for Nurses; Collaborator, American Journal of Nursing, etc. Duodecimo; 208 pages. New York: THE MACMILLAN CO., 1908.

In this little manual the author has succeeded in condensing, and presenting clearly and in practical fashion, the essentials of hygiene, as they concern a nurse in her daily work or in her elementary school course. There is a well-planned section on food, dealing with composition, preservation, adulteration, etc.; cooking is intentionally not considered here. The essentials of ventilation; disinfection; disease dissemination; sewage and garbage; personal, domestic and school hygiene; and cognate subjects are well presented. An outline for a course of study in venereal hygiene, water supply, quarantine laws, etc., is sketched in the preface.

Books Received

General Surgery. A Presentation of the Scientific Principles Upon Which the Practice of Modern Surgery is Based. By ERICH LEXER, Professor of Surgery, University of Königsberg. *American Edition*, edited by ARTHUR DEAN BEVAN, M.D., Professor and Head of the Department of Surgery, Rush Medical College, Chicago. An authorized translation of the second German edition by DEAN LEWIS, M.D., Assistant Professor of Surgery, Rush Medical College. Large octavo; 1041 pages; 449 illustrations (some in colors) and 2 colored plates. New York and London: D. APPLETON AND COMPANY, 1908.

Progress in Surgery.

A Résumé of Recent Literature.

Hernia of the Ovary in Infants, with Reference Especially to the Operative Treatment of the Affection. J. H. NICOLL, Glasgow. *Edinburgh Medical Journal,* September, 1908.

After reporting 29 cases of this condition, the author comes to the following conclusions:

1. Hernia through the inguinal canal in female children is common under one year, or one year and a half, uncommon over that age.

2. Hernia in that site almost invariably contains the ovary in infants under eighteen months. Hernia in that site which *develops* in children over eighteen months comparatively rarely contains the ovary.

3. Hernia of the ovary in infants under eighteen months occurs into the patent canal of Nuck, which constitutes the sac. The contents of the sac are—the ovary—as a rule accompanied by the Fallopian tube (usually the free extremity; occasionally a "loop" of the middle portion), and, in less than 20 per cent., by intestine or omentum. The ovary may be reducible or not.

4. The descent of the ovary is probably connected with the presence of an over-strong or abnormally short round ligament, that structure then acting in a way analogous to that of its homologue in the male, the gubernaculum testis. In nearly all the cases operated on a well-developed round ligament has existed, enfolded in the posterior wall of the patent canal of Nuck, and disappearing above under the mesovarium.

5. The patency of the canal of Nuck is related to the presence of the herniated ovary, as is, in the other sex, the patency of the processus vaginalis to the presence of the testicle in cases of incomplete descent of that organ. Both ovary and testicle are extra-peritoneal, and both invaginate the posterior wall of the patent peritoneal culde-sac. By this invagination the herniated ovary acquires a mesovarium. This was found in many of the cases, attaching the ovary to the posterior, or postero-external wall of the sac, and so disposed as to be partly extra and partly intra-abdominal, thus suggesting a prolapse of the outer portion of the broad ligament.

6. Hernia of the ovary in infants otherwise normal is occasionally bilateral. So-called bilateral hernia of the ovary associated with abnormalities of the external genitals—pseudo-hermaphrodism—is problematical. In such cases exploratory operation reveals a testicle and not an ovary. That, at least, has been my experience in seven cases.

7. Encysted hydrocele of the canal of Nuck is quite uncommon in infants.

Hernia of the ovary appears to tend to a natural cure during the second year of life. . . . In other cases spontaneous disappearance of the ovary from the patent inguinal canal is succeeded by the appearance of an enterocele or epiplocele.

There is nothing novel in the author's operative treatment of this lesion.

Hernia of the Appendix. Report of Twenty-one Cases. W. B. DE GARMO. *The Post-Graduate,* August, 1908.

De Garmo says that considering the great variety of positions in which the appendix is found, it is not in the least surprising that it should be the occasional occupant of a hernial sac. The condition is probably more common than is supposed, as many of these appendices are probably reduced where the patient assumes the recumbent posture for operations. Extreme sensitiveness, either in the tumor or surrounding parts, during the manipulation of the hernia, should always cause the surgeon to suspect that there is some conditions present other than the hernia.

In the majority of instances where the appendix is found in a hernial sac, the pathological condition of the organ is such that its removal is necessary. Although there may be objections to doing an appendicectomy through a hernial wound, as a rule the colon has dropped down enough to make the procedure a comparatively easy one. In only one case was the author unable to do the operation this way.

Radical Cure of Inguinal Hernia—Fascial Suture (*Zur Radikaloperation der Leistenbrüche-Fascien-Knopfnähte*). HACKENBRUCH, Wiesbaden. *Muenchener Medizinische Wochenschrift,* August 11, 1908.

The external oblique fascia is split somewhat more mesially than customary in order to give a larger lateral flap.

The sac is exposed as usual, tied off, and drawn upward and outward beneath the internal oblique as advised by Kocher. The cord is now displaced and the mesial flap of the external oblique fascia (not the internal oblique and transversalis muscles) is sewn to Poupart's ligament. The end is placed upon the fascia and the lateral aponeurotic flap drawn over it and sewn to the fascia. The cord lies between two layers of fascia. By making the lateral flap large, the mesial flap when drawn down to Poupart's pulls the underlying muscular layers over to the region of the canal. The author uses iodin catgut throughout. He keeps the patients in bed three weeks; the results in 68 cases for three years have been excellent. Muscle suture, according to Hackenbruch, is uncertain.

Three Cases of Mixed Ovarian Cystic Tumors with Peritoneal Metastases; Incomplete Operation; Prolonged Period of Well-Being (*Trois observations de rétard prolongé des récidives et de la généralisation dans les cas de Kystes mixtes des ovaires, malgré la limitation farcée des operationes d'exércèse*). E. VINCENT, Lyons. *Annales de Gynécologie et d'Obstétrique,* August, 1908.

The first case was in a woman of 35 years, in whom both ovaries were converted into mixed cystic tumors, with ascites and peritoneal transplantation throughout the abdomen. The main tumors were removed. The patient two years later is still in the best of health. The second case was one of myxosarcoma of both ovaries with many peritoneal metastases. Removal of the ovarian growths was followed by a period of health lasting four years, death occurring five years after operation. The last case was one of mixed multilocular cyst of enormous dimensions with peritoneal grafts. Five years later at a second operation, melanotic masses were removed, and two years later a third operation was performed, shortly after which the patient succumbed. These cases show that it is worth while to remove apparently inoperable ovarian growths, as the metastases in many instances remain latent for years, and in a few reported cases actual and permanent cure has been noted.

Endometritis Exfoliativa-Dysmenorrhea Membranacea. H. EHRENFEST, St. Louis. *American Journal of Obstetrics,* September, 1908.

The author has had the opportunity of examining several membranes. There is no evidence of inflammation, the uterine case giving a faithful though exaggerated picture of normal menstruating mucous membrane. It may, in some cases, be difficult or impossible to distinguish between a membrane and a decidua from an early abortion. Should large areas of mucosa be cast off in one piece, and the cervix prove small and contracted, the well-known uterine colic, usually characteristic of this trouble, develops.

The Treatment of Acute General Septic Peritonitis. J. F. W. ROSS, Toronto. *American Journal of Obstetrics,* September, 1908.

Ross treats diffuse peritonitis by immediate operation with rapid removal of the cause, such as a gangrenous appendix, followed by thorough irrigation of all parts of the abdominal cavity and then complete closure of the wound without drainage. A strong current of saline solution is introduced by means of a long, blunt trocar, which is passed into all the pockets until the fluid returns clear. No great effort to prevent eventration is made, the bowel

being reduced by forcibly raising up the edges of the wound. Lymph deposits are not wiped away and all unnecessary trauma is avoided. The author regards general rigidity of the abdominal wall as one of the surest signs of peritonitis. When a patient is first seen in collapse and in the terminal stages of peritonitis, Ross refuses to operate and gives opium. He has little confidence in the Fowler position or rectal saline infusion.

In the series of cases reported 37 died and 25 recovered; of the last 30 cases only 10 died.

Diffuse Peritonitis in Women. ELLICE MCDONALD. *New York State Journal of Medicine*, August, 1908.

In an extensive survey of the subject, McDonald reports that the majority of cases of peritonitis follow appendicitis. In cases reported by Clairmont and Ranzi, 60 per cent. ended fatally—those infections following perforation of the appendix were less dangerous than those following rupture of a perityphlitic abscess and the infections following gangrene were the most serious. In a series of cases by Dudgeon and Sargent, the preeminence of the colon bacillus as a cause of peritonitis was established, which disproves the favorite theory that the lesions of peritonitis of intestinal origin are due to the common pyogenic cocci. From the combined series, it is shown that the frequency of diffuse peritonitis from bowel lesions is relatively high, while that from pelvic causes is proportionately small.

The streptococcus causes the most virulent infection and is marked by severe clinical manifestations. Staphylococcus infections as a rule show metastatic foci, especially in the endocardium. Colon bacillus infection is usually the result of perforation of the bowels. Gonococcus infection is rare and the course usually not severe. In most cases it is due to a pelvic condition. Pneumococcus peritonitis is secondary to a similar lesion elsewhere. Tuberculous peritonitis shows an average mortality of 30 per cent.

The diagnosis is not always easy. Rigidity is a prominent symptom, but is often absent. Vomiting is a constant symptom. The pain is prominent, it is fairly characteristic and is a great aid to diagnosis. It depends upon two conditions: First, it is now recognized that most of the pain is due to the accompanying lymphangites. This, in part, causes the crampy pains; the lymph vessels of the intestines press upon the sensory nerves as the lymphangitis extends. The pain is often not localized, but is sometimes referred, like that of appendicitis, to the epigastrium. This is supposed to be due to the infection in the perilymphatic tissue and lymph glands around the aorta.

Cardiospasm; with Report of 40 Cases. H. S. PLUMMER, Rochester, Minn. *Journal of the American Medical Association*, August 15, 1908.

Plummer reports and discusses forty cases of cardiospasm, and the etiology, symptoms, diagnosis and treatment of the condition generally. He questions primary atony of the esophageal muscle being other than a very infrequent cause, and considers the theory of congenital disposition interesting but not susceptible of demonstration. The cause of the spasm is largely speculative, in the majority of cases evident etiologic factors are wanting. The normal action of the complicated mechanism of deglutition is only imperfectly understood and even less is known of its disturbances in cardiospasm. Three clinical stages can be recognized: 1. In this stage the peristaltic contraction of the esophagus is sufficient to force the food through the spastic cardia. This is characterized clinically by discomfort, pain, choking sensation, etc. 2. The peristaltic force is insufficient and the food is immediately regurgitated. As a rule the spasm is at first periodic, but later becomes more continuous. Marked exacerbations of the spasm characterize the whole course of the disease. There is an early hypertrophy of the esophageal musculature, followed later, as the spasm increases in severity, by the muscle becoming inadequate to overcome the obstruction and dilatation and atony results. 3. Once the esophagus begins to give way the dilatation is rapid. Clinically we have in this stage, retention of food in the esophagus and its regurgitation at irregular intervals after ingestion. If the spasm is mild for a sufficient length of time the hypertrophy may become extreme and dilatation not occur or be long delayed, or be able to overcome a very marked obstruction. The symptoms above described are almost pathognomonic. In the majority of cases the first attack of spasm occurs suddenly when the patient is at table, a spasmodic choking sensation, generally located at the cardia and radiating to the back or neck. It is rarely described as a pain. In the diagnosis the following points should be demonstrated: 1. Regurgitation from the esophagus and not from the stomach. 2. The existence and character of the obstruction at the cardia. 3. The presence or absence of esophageal dilatation; its shape, size, etc. 4. The presence or absence of gross lesions in the esophagus or vicinity which might excite the spasm. To do this the following measures have been employed: 1. The various stomach tube tests. 2. The passage of a bulbous sound on a whalebone staff. 3. The passage of the author's sound on a previously swallowed silk thread. 4. Radiographing a bismuth mixture in the esophagus. 5. Determination of the size of the dilatation, by a dilated rubber balloon in the esophagus. 6. Esophagoscopic examination. In his most difficult cases he succeeded in passing his olive-tipped sound threaded on a previously swallowed silk thread after other methods had failed. The details of all these methods are described. Until recently the treatment has consisted in such ineffectual measures as attention to the general health; fluid, non-irritating diet; effervescent drinks; bromids; the frequent passage of large sounds; and as a last resort, gastrostomy. The forcible dilatation of the cardia after gastrostomy is only warranted in serious cases in which other means fail. Russell was the first to demonstrate fairly the efficacy of dilating the cardia with a silk covered rubber balloon. Plummer describes the method and the apparatus, and gives a tabulated report of the forty cases treated. The immediate results are striking: the patients are almost always able to take any kind of food at the next meal, and the gain in weight and strength is very marked. In the great majority of the cases there has been no recurrence, and marked return of the symptoms has not occurred in any case. There will, he says, undoubtedly be some recurrences among those more recently treated, but that there have been so few has been a constant source of surprise. Plummer thinks recurrences will be rare in patients who have remained well two years or more. The patients whom he has had an opportunity to examine at some time after treatment show that there is a tendency for the esophagus to return to its normal size. So far as possible he will follow up the cases and report the ultimate results.

Artificial Respiration in Its Physiological Aspects. E. H. SCHÄFER, Edinburgh. *Journal of the American Medical Association*, September 5, 1908.

Schäfer discusses the physiologic principles involved in artificial respiration and their practical application. The most important of these principles is the elasticity of the lungs and thorax, by which alterations or distortions in form by external force are followed, on its removal, to a return to the original form. It is by this elasticity that expiration is ordinarily effected, the distorting force acting by increasing the lung capacity by raising the ribs and repressing the diaphragm, which return to their original position on its removal. Artificially, the distorting force can be made to act in a reverse manner, viz., by compressing the lungs and producing expiration, the elasticity of the thoraic walls then causing inspiration when the distorting force is removed. The use of this principle in artificial respiration was first demonstrated by Dr. B. Howard, of New York, who utilized it in his method of artificial respiration, published in 1868, by alternate compression and relaxation of the lower ribs, the patient being in the supine position. This method has been largely used, it is simple, but it has the disadvantages of the liability of the tongue falling backward and blocking the pharynx, the fragility of the ribs in senile subjects and the danger of injury to

the enlarged and congested liver, especially in drowning cases. The well-known methods of Marshall Hall and Sylvester do not specially utilize this principle, and also have their special disadvantages. Schäfer refers to his experiments undertaken in 1890 as chairman of a committee of the Royal Medical and Chirurgical Society of London, which resulted in the recommendation of what he has called the "prone pressure method," which he illustrates. It consists in applying vertical pressure over the lowest ribs and then removing it ten or twelve times a minute, the weight of the operator's body being used and hardly any muscular exertion being required. In this way we easily get an air exchange of six liters, which is more than the average in normal respiration. The methods of demonstrating this are described, as well as the results of comparative experiments to test the efficacy in this respect of the other methods of arificial respiration. All were found to be inadequate, the Howard pressure method giving the nearest to the normal figure of air exchange. In cases of drowning the superiority of the prone pressure method are obvious; it is fully efficient; it can be used by a single person without fatigue; it is simple and easily learned and it permits the tongue to hang down and water and mucus to escape from the mouth. It is equally applicable in cases of overdose of anesthetics. One of the difficulties of anesthesia is the excessive secretion of saliva and mucus, and with chloroform there is the special danger of cardiac inhibition. Both of these dangers are obviated by the hypodermatic administration, before the operation, of a small dose (1-50 grain) of atropin sulphate, and Schäfer thinks it strange that this is not adopted as a routine measure by anesthetists. If it were, there would be, he thinks, fewer deaths during anesthesia to report. When conditions arise in which artificial respiration is required but none of the ordinary methods are available without the use of apparatus, the simplest appliance is an ordinary bellows or a piston cylinder. With the nozzle in one nostril, it is possible by vigorous use of the bellows, the mouth being closed, to distend the lungs efficiently and to keep up artificial respiration. But it is safer in operations involving opening both sides of the chest, to intubate the larynx or even to perform temporary tracheotomy, and in any case it is well to adopt, if possible, the prone position for the patient. For some reason, the supine position tends to increase dyspnea.

Preliminary Report of a Case of Resuscitation of the Heart by Subdiaphragmatic Massage. C. S. WHITE, Washington, D. C. *Maryland Medical Journal,* September, 1908.

A boy, 12 years of age, who was about to be operated upon for a popliteal abscess, ceased breathing and became pulseless about 15 minutes after chloroform anesthesia was begun. Artificial respiration for five minutes and other methods having proved of no avail, an incision was made in the epigastrium and massage of the heart was begun, the heart being compressed at the rate of about 25 times per minute. After about one minute a feeble tremor could be felt; strychnia gr. 1/40 was given hypodermatically and the massage continued. Soon rhythmical pulsations could be felt against the fingers, the pulse could be felt at the wrist and at the end of seven minutes the apex beat was distinct at a rate of 120 per minute. The abscess was opened and drained. Within one hour after the completion of the operation, the patient had a convulsion. This was repeated once or twice. He died 20 hours later. No autopsy.

Prominent Symptoms in the Diagnosis of Gastric and Duodenal Ulcers. C. GRAHAM, Rochester, Minn. *Journal of the American Medical Association,* August 22, 1908.

Graham calls attention to four points that seem to stand out prominently in the larger number of cases of gastric and duodenal ulcer. These are: First, the periodicity of the attacks. The onset is often sudden; an attack of acid dyspepsia appearing without warning or apparent cause and lasting for days or months, followed by an intermission or marked remission, lasting for days, weeks or months, and giving place again to another attack like the first. These changes are so characteristic as to often, by themselves alone, warrant a probable diagnosis. Second, the long period of time during which this cycle has continued before surgical relief is called for. Usually the history shows that the condition has run from five to twenty years, frequently longer. In a series of 258 duodenal cases, the average duration was just short of 12½ years. Third, the characteristics of pain, its great diagnostic significance and its place in differential diagnosis. Its distinguishing feature is not its location or the kind of pain, but its time. It varies from mild distress to very intense pain, but its appearance some time after meals (oftener it is more exact to say before meals) and its relief by eating, are characteristic. It is epigastric, radiating seldom to other areas, and in the later stages, when complications (adhesions, obstruction, perforation) have occurred, the relief by eating and other measures fails and surgery is called for. The lower down the ulcer is located, the longer, as a rule, is the relief of pain after eating, and this is one of the best indications of the location of the ulcer. Fourth, Graham remarks on the usual ready control of the symptoms by the measures used to control pain during the attack, as food, alkalies, irrigation and vomiting, as being characteristic of the condition except in its later stages with complications. Purely functional hyperacidity may cause symptoms difficult to differentiate from those of early ulcer, but Graham holds that when we meet with the combination here described, we may justly look for ulcer in the stomach or duodenum in a large proportion of cases.

A Case of Carcinoma of the Jejunum; with Remarks on Malignant Disease of the Small Intestine. C. R. KEYSER, London. *Lancet,* August 1, 1908.

The author reports a case of primary cancer of the jejunum with extensive infiltration of the abdominal cavity, in which death was due to perforation of the growth. The author's statistics show that primary cancer of the jejunum is extremely rare, only 12 cases having been reported. Cancer of the ileum, on the other hand, is not infrequent, while cancer of the duodenum occurs as frequently as cancer of the ileum and jejunum together. The symptoms of cancer of the small intestine are practically those of cancer of the upper part of the colon—viz.: pain, often colicky in nature, a tendency to constipation, with occasional diarrhea, anemia, and, in the final stages, cachexia. When palpable, the tumor is, in the majority of cases, felt in the iliæ fossa, most commonly in the left. Of the 12 cases, 4 died of perforation. In several of the reported cases, the neoplasm was an accidental find at autopsy.

Local and Surgical Treatment of Chronic Diarrhea. SAMUEL G. GANT. *New York Medical Journal,* August 15, 1908.

Gant says that patients suffering from chronic diarrhea suffer not only from exhaustion and loss of weight brought about as a result of frequent evacuations, but also from nervous phenomena, anemia, skin eruptions, headache, and other manifestations of intestinal auto-intoxication and underfeeding.

The primary cause of chronic diarrhea is situated in the colon, and more especially the sigmoid flexure and rectum, very much more frequently than is generally supposed. Although in some instances the cause has been some pathological change in the stomach and small intestine, the disease in the lower bowel remains after this has been cured, so that the diarrhea continues after the original cause has been removed.

The direct inspection of the lower bowel by means of the proctoscope or sigmoidoscope will reveal some pathological process which can readily be treated by local means. Although various conditions may cause chronic diarrhea, colitis is by far the most common cause. The colitis may be catarrhal, tuberculous, dysenteric, syphilitic or gonorrheal in character. As a general rule, when ul-

ceration is extensive it most frequently involves the sigmoid or rectum.

The use of the various medicaments which are prescribed for chronic diarrhea, do good in only a limited number of cases, and then only while the drugs are being taken. Ulceration in the colon can rarely be cured by medicines. Medical treatment should, therefore, be discarded in the treatment of chronic diarrhea except in cases where, for any reason, direct treatment of the bowel is refused or found impracticable.

Non-surgical treatment consists in colonic irrigations. Where difficulty is found in inserting the rectal tube, this may be overcome by introducing the proctoscope, and, after locating the entrance to the sigmoid, inserting the tube directly into the colon. If the diarrhea does not become less, it is proof positive that the affected area has not been reached.

Operative measures are in many instances effective and involve little danger. The following are the operations that have been used with more or less success: 1. Resection of the colon; colostomy; appendicostomy; cecostomy with irrigation of the small intestine (Gant's operation); intestinal exclusion.

Appendicostomy is the most popular surgical procedure at present. The patients rarely are irritated by the involuntary discharge of gas and feces. However, there is a number of possible advantages: short appendix, the organ bound down by adhesions, the smallness of the opening, etc.

A much more desirable operation is one devised by the author of making an opening in the cecum and irrigating both the small and large intestine, "cecostomy with an arrangement for irrigating both the large and small intestine (Gant's operation)."

After recovery, when spontaneous healing does not follow withdrawal of the catheters, which are inserted at the time of operation, the opening may be closed by cauterization or with sutures without general anesthesia or the necessity of entering the peritoneal cavity.

The procedure referred to is also useful in the treatment of conditions other than diarrhea. It may be employed to advantage in the treatment of ordinary and pernicious anemia, autointoxication, ptomaine poisoning, diarrhea of children, intestinal feeding following operations on the mouth, throat, esophagus or stomach, and gastric ulcer, cancer or other disturbances of the stomach where rest is indicated, and it also can be used for studying different diseases, to note the amount and character of the intestinal juices and discharges, the nature of the feces, the action of cathartics and many other interesting problems.

Acute Diverticulitis of the Sigmoid, with Operation Before Rupture. G. E. BREWER, New York. *Journal of the American Medical Association*, August 15, 1908.

The author reports a case of diverticulitis of the sigmoid, the first in which diagnosis was made and operation performed before the occurrence of rupture, and the only one recorded in which the patient survived two operations for this condition. In the first attack there was a localized abscess, but the patient recovered and remained well over five years. In such cases Brewer would lay down no general rules of technic, but if the diverticulum is large, attached by a broad base or covered with a plexus of enlarged vessels, the safest method, he thinks, would be extra peritoneal drainage, as chosen in the case reported. If, from the situation, this is impracticable, he suggests packing with gauze and leaving it in place for from 48 to 72 hours or until firm adhesions have formed, then removal of the gauze and free opening of the abscess, allowing it to drain through the channel thus formed.

Acute Dilatation of the Stomach (*Zur Kenntniss der acuten Magenektasie*). M. BORCHARDT, Berlin. *Berliner Klinische Wochenschrift*, August 31, 1908.

Borchardt refers to those cases of post-operative dilatation of the stomach associated with obstruction of the transverse duodenum by the lower edge of the mesentery. The author believes that this condition is predisposed to by an unusually long mesentery; that the gastric dilatation is the primary condition; that the enlarged stomach forces the small intestines into the pelvis, thereby producing traction on the mesentery and consequent obstruction of the duodenum. The author believes that the diagnosis is easy if the condition is thought of, and that the best treatment centers about the judicious use of the stomach tube; the stomach should be emptied the minute any dilatation is suspected; at the same time the patient should be made to lie on the abdomen. If the condition is not suspected early and the patient is in an advanced state of collapse, the only resort that might prove of any avail is a gastric fistula. Gastroenterostomy, in the author's opinion, is not indicated.

A Case of Varicose Epigastric Veins Following Phlebitis. J. E. LANE, New Haven. *Yale Medical Journal*, July, 1908.

The patient had an attack of typhoid fever about seven years ago, during which both legs were swollen and painful. He presented himself with a number of healed and unhealed varicose ulcers on the left leg, with symptoms and signs pointing to a phlebitis of the veins of the extremity. The interesting feature was the pressure of two large tortuous veins on the left side of the abdomen, one of which was evidently the superficial epigastric, the other the superficial thoracico-epigastric, running toward the axilla.

The Alleged Urinary Manifestations in Diseases of the Pancreas. J. H. SCHROEDER, Cincinnati. *Journal of the American Medical Association*, September 5, 1908.

Schroeder has examined the urine in 85 patients for Cammidge's urinary reaction, following that author's technic strictly, in a number of diseases, including chronic pancreatitis, cancer of pancreas, gastric cancer, abscess of pancreas, gallstones, catarrhal jaundice, tuberculosis of peritoneum, abdominal tumor (probably of the pancreas), cancer of liver, cholecystitis and pulmonary tuberculosis. In the last three named, as well as in a number of other pathologic conditions there was no reaction. It was positive in 3 out of 4 cases of chronic pancreatitis, one of cancer of the pancreas, 2 out of 3 of gastric cancer, once in 4 cases of gallstones (in this case the pancreas was hard and nodular), once in 4 cases of catarrhal jaundice, in one case of peritoneal tuberculosis, and in both of 2 cases of tumor of the upper abdomen, probably of the pancreas. The conclusions he deduces are: 1. It has been proved that inflammatory and destructive disease of the pancreas may give rise to the appearance of certain, as yet undefined, bodies in the urine, belonging possibly to the sugars or related compounds. 2. The reaction is not pathognomonic for disease of the pancreas, in the clinical sense. Extensive clinical observations on the urine in pancreatic and other diseases must finally determine the value of the pancreatic reaction.

Another Case of Hypophysis Operation for Degeneratio Adiposo-Genitalis (*Ein neuer Fall von Hypophysisoperation bei Degeneratio adiposo-genitalis*). A. VON EISELSBERG and L. VON FRANKL-HOCHWART, Vienna. *Wiener Medizinische Wochenschrift*, July 30, 1908.

The patient presented, briefly, the following history: For three years he had suffered from headaches, severe and intermittent; diminution of eyesight and dizziness; occasionally there was double vision and on one occasion consciousness was lost. For some years he had noted that he was becoming more youthful in appearance; sexual appetite and erections had been absent for many years. Physical examination showed absence of all hair except on the top of the head, a general adiposity, heminanopsia, strabismus and immature sexual organs. A tumor of the hypophysis was diagnosed and an operation was advised. The essential steps of the operation consisted in flapping back of the nose, removal of the bone covering the frontal

sinus, clearing out of the nasal cavity and removal of the bone covering the sella turcica. The dura was then opened and a grayish tumor was noted. As much of this as was possible was removed with a sharp spoon, and the cavity was packed with gauze. Suture of the nose in situ. Six months later the patient was free from all subjective symptoms with the exception of the disturbances in vision. No mention is made of the sexual and other phenomena after operation.

Principles of Hotz's Operation for Cicatricial Ectropion of the Lower Lid. F. C. HOTZ, Chicago. *Annals of Ophthalmology*, April, 1908.

The border of the normal lower lid is firmly fastened to the orbital margin at the inner and outer canthus; it snugly adapts itself to the eye-ball, and is held in this position chiefly by the elastic tension of its fibers. All modern operations for senile ectropion aim to shorten the lid border in order to restore its tension. In cicatricial ectropion, this is but a minor step, as there is not mere eversion of the lid border, but the whole lid is dragged from its place. It must be replaced, and recurrence prevented by eliminating traction from below. Nature's method is represented by the normal anchoring of the mass of the cheek to the infraorbital margin, so that the effect of any downward traction ceases at this point and does not affect the lid. This protective barrier is destroyed in the course of cicatricial ectropion so that the weight of the cheek and traction from below are communicated to the lid, and must be reconstructed. The anatomic relations between the lid and the cheek can only be restored by means of two separate flaps, one to replace the skin of the lid, the other to cover the wound area of the cheek; these two flaps must join each other along the infraorbital margin and be firmly anchored there. Hotz circumscribes a large semilunar flap mobilizing the lower lid, which is dissected up until the lid can be raised back into its normal position. The overstretched border is shortened by removing a small piece at the outer canthus. The margin of the lid flap is fastened by numerous fine sutures to the tarso-orbital fascia just above the infraorbital margin. The lid margin is drawn up as far as possible, and held in position for a couple of days by ligatures running upward and fastened to the brow by adhesive plaster strips. The wound area below the lid is covered by a separate Thiersch flap cut from the skin of the arm. The same principle of separate flap and anchoring must be followed if the lower lid is restored by tissues taken from a distance as Wolff or Thiersch graft. The distinction between the skin of the lid and that of the cheek must be preserved, and their boundary marked by fixation to the infraorbital margin by the tarso-orbital fascia.

Injections of Alcohol in the Treatment of Blepharospasm. E. VALUDE. *Annales d'Oculistique*, April, 1908.

Valude reports three cases to show that alcohol injections made at the point of exit of the facial nerve constitute an excellent means of treatment, and are inoffensive and but slightly painful. It is of great value in trigeminal neuralgia. Moderate facial paralysis may follow the injection, but this usually disappears under treatment. It must not be allowed to develop to such an extent as to interfere with closure of the eyes during sleep (lagophthalmos), but be counteracted by electricity and massage. Valude claims that the patients will prefer immobility of the cheeks and lids to the discomforts of spasm. The alcohol is used in 80 per cent. solution with stovaine, injecting from 1 to 1.5 cc. The injection should be made slowly, moving the point of the needle around the supposed point of exit of the nerve. Usually only one injection is required, and cure is generally permanent. Exposure of the cornea, in case of development of facial paralysis, may have to be prevented by occlusion, provisional suture of the lids, or temporary blepharorrhaphy, and the use of electricity.

Resection of the Elbow with Maintenance of Motion (*Ueber Ellbogenresektionen mit Erhaltung der Beweglichkeit*). VON SCHMIEDEN, Berlin. *Berliner Klinische Wochenschrift*, August 17, 1908.

The operation performed at Bier's clinic is as follows: The end of the humerus, after resection, is made convex, while those of the radius and ulna are made concave, so that the physiological relations are maintained. A flap of the triceps muscle and tendon is then brought between the ends of the bones and sutured to the tissues on the anterior surface; the wound is closed. At the end of one week, motion at the elbow is begun, the joint being placed in a different position on each successive day. When the wound has firmly healed, massage, active and passive motion, and hot air baths are in order. Schmieden emphasizes a few points that are essential to the success of the operation. In the first place, just sufficient bone must be resected; if too much bone is taken away, there will follow too much motion in the lateral direction. If too little, limitation of motion will ensue. The surgeon must also be acquainted with an excellent *x*-ray picture of the joint before operation, in order to enable him to remove all projecting surfaces and isolated masses of bone that might otherwise be overlooked. In two cases, necrosis of the implanted muscle has occurred, but this did not entirely negative the functional result. An important element is the musculature of the extremity; if this is atrophied from disuse or disease, the result will, of course, be not as good as if the muscles were well developed. Of 11 cases, the end result was excellent in 6, 4 were improved; one was unimproved, due, as the author believes, to arthritis deformans.

The Treatment of Joint Tuberculosis. EDWARD H. OCHSNER. *The Journal of the Michigan State Medical Society*, August, 1908.

The impression among many seems to be that fresh air is much more important in pulmonary tuberculosis than in tuberculosis elsewhere, because impure air is apt to carry germs into the lungs and thus cause secondary infection. While this is true to a certain extent, it is after all not so much the pyogenic bacteria which might come in contact with the diseased lung tissue as it is the free ammonia in the air which reduces the resisting power of the patient to combat disease. In joint tuberculosis, as in all other forms of tuberculosis, it is of course a struggle between the individual on the one side and the infection on the other, and the whole plan of treatment consists in strengthening the defensive powers of the former by increasing its resisting power, and to weaken the latter as much as possible.

One method of noting the resisting power of the patient is by studying the opsonic index. The author goes into considerable detail on this subject, which is no doubt of considerable value. The two factors which lower the opsonic index more than any others are pain and secondary infection.

The only reliable and safe way to relieve the pain is by securing absolute rest of the involved joint. The best bandages are plaster-of-Paris. Secondary infections should be avoided as far as possible by absolute cleanliness. When a sinus has formed, more rapid healing can be encouraged by injecting the sinus with solutions of bismuth after the method of Beck of Chicago.

The author leaves all casts on for a period of six months.

Fifteen Cases of Anthrax Treated in the Philadelphia Municipal Hospital. B. F. ROYER and E. BURVILL-HOLMES. *Pennsylvania Medical Journal*, September, 1908.

Of the 15 cases, 3 died. Blood cultures were made in 9 cases; the cultures were positive only in the fatal cases. In the vast majority of instances the primary pustule was on the face or neck. The authors tried various methods of treatment in their series and come to the conclusion that in certain cases the use of Sclava's serum alone is curative; in severe cases the serum should be combined with cauterization by powdered bichloride of mercury. Many cases will be cured by excision and cauterization alone.